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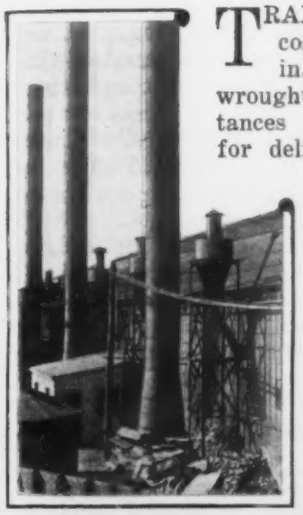
Burning Pulverized Coal in a Sheet Mill

Installation at the Newport Rolling Mills Replacing Natural Gas Fuel—Coal Milling Plant—Fuel Records

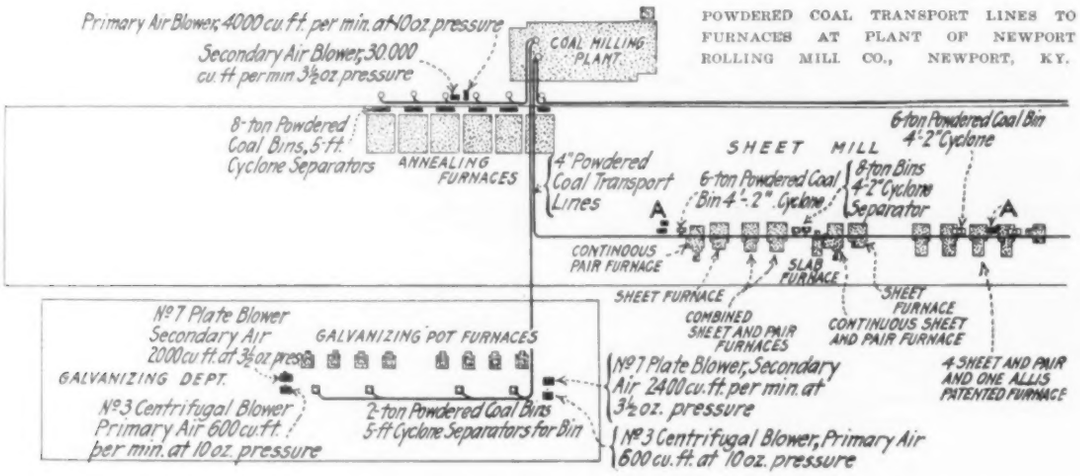


TRANSPORTING pulverized coal in bulk through 4-in. diameter standard wrought pipes for varying distances totaling over 2500 ft. for delivery to dust-tight fuel bins located at furnaces and automatically recording at the point of sending, the amount of fuel transported to each furnace bin for the sake of fuel records on individual furnace operation, are the outstanding mechanical features of the compressed air transport system installed at the plant of the Newport Rolling Mill Co., Newport, Ky.

The plant is located on the Licking River near its junction with the Ohio River opposite Cincinnati, and produces black and galvanized sheets, blue annealed sheets, tank plate, corrugated sheets, metal shingles, roofing and siding. The mill is one of many which was obliged to return to coal as fuel on account of failure of the natural gas supply during the past three years. To meet the emergency, hand-firing methods were employed and some furnaces equipped with mechanical stokers. Pulverized coal equipment, installed by the Quigley Furnace Specialties Co., 26 Cortlandt Street, New York, is now superseding all former firing methods as rapidly as the necessary changes can be made, new equipment installed and the furnaces rebuilt.

There are 15 sheet mills now in operation rolling

Powdered Coal System Supplying a Slab Furnace. Cyclone separator and bin with feed controll ers are shown in center


Primary Air Blower, 4000 cu. ft. per min. at 10 oz. pressure
Secondary Air Blower, 30,000 cu. ft. per min. 3½ oz. pressure
COAL MILLING PLANT
8-ton Powdered Coal Bins, 5-ft. Cyclone Separators
ANNEALING FURNACES
4" Powdered Coal Transport Lines
SHEET MILL
6-ton Powdered Coal Bin 4'-2" Cyclone
8-ton Bins 4'-2" Cyclone Separator
6-ton Powdered Coal Bin 4'-2" Cyclone
A
A
CONTINUOUS PAIR FURNACE
SLAB FURNACE
SHEET FURNACE
COMBINED SHEET AND PAIR FURNACES
SHEET FURNACE CONTINUOUS SHEET AND PAIR FURNACE
4 SHEET AND PAIR AND ONE ALLIS PATENTED FURNACE
No. 7 Plate Blower Secondary Air 2000 cu. ft. at 3½ oz. pres.
GALVANIZING POT FURNACES
GALVANIZING DEPT.
No. 3 Centrifugal Blower Primary Air 600 cu. ft. per min. at 10 oz. pressure
2-ton Powdered Coal Bins 5-ft. Cyclone Separators for Bin
No. 7 Plate Blower, Secondary Air 2400 cu. ft. per min. at 3½ oz. pressure
No. 3 Centrifugal Blower, Primary Air 600 cu. ft. at 10 oz. pressure

POWDERED COAL TRANSPORT LINES TO FURNACES AT PLANT OF NEWPORT ROLLING MILL CO., NEWPORT, KY.

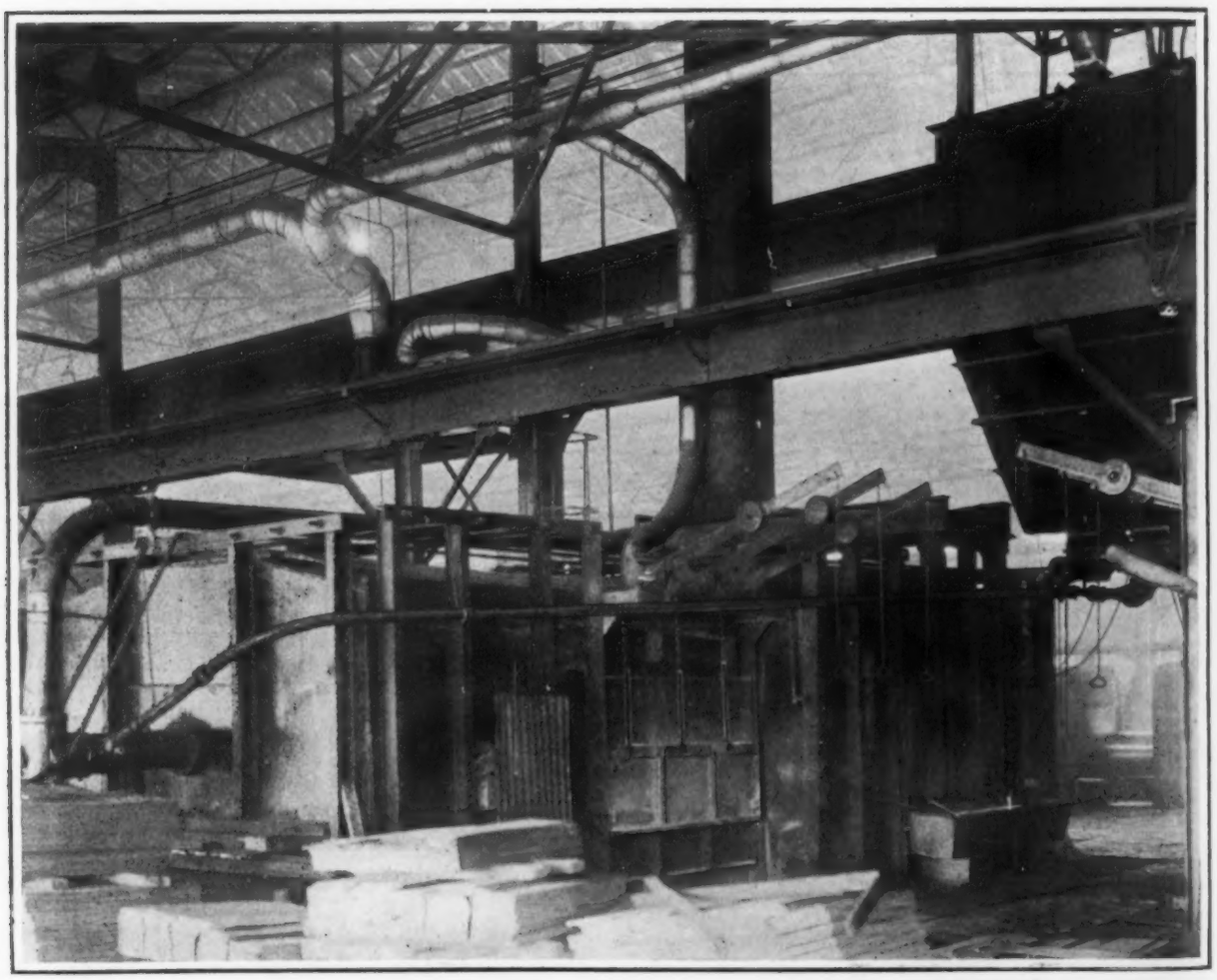
sheets from 16 gage to 34 gage. The furnace equipment for three mills consists of 10 combination sheet and pair furnaces, three continuous pair furnaces with adjacent sheet furnaces, and two slab furnaces for heavier sheets, all of these operating on powdered coal.

There are five additional sheet mills under construction together with necessary powdered coal fired furnaces which it is expected will be in operation this fall. The first furnace using powdered coal was fired in November, 1918, and since that time the others have been added as fast as the furnaces could be remodeled for the powdered coal equipment.

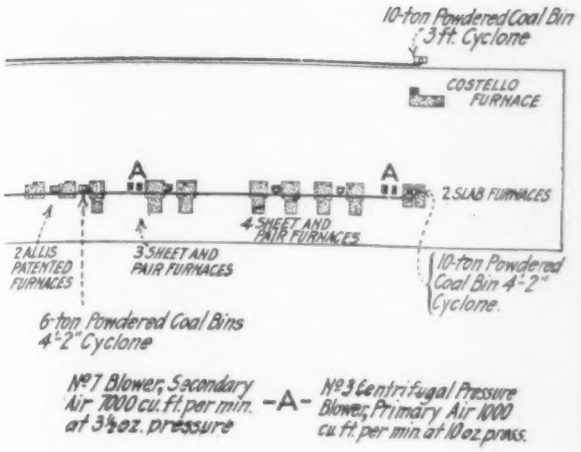
Present plans call for a total of 20 mills served by 23 furnaces. The original plans called for eight double-box, double-chamber pulverized-coal fired annealing furnaces to take the place of an equal number of hand and stoker-fired furnaces. This number has been reduced to six as a result of the performance of the two which have been operating with powdered coal, the output of the sheets treated having greatly exceeded expectations. Two have been in operation for nearly one year. Two more are about completed, and two are under construction.

Based on investigation and compilation of data on output of hand-fired, stoker-fired and powdered-coal fired annealing furnaces in this plant, it is stated that the six furnaces of the type adopted using powdered coal will handle a tonnage which would have required eight stoker-fired furnaces of the same size.

The galvanized department has eight pots, all



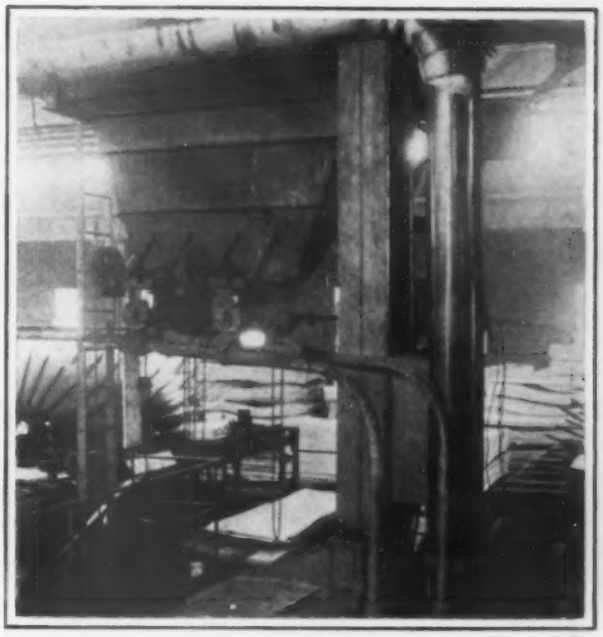
Primary and Secondary Air Lines Are Shown Leading to Burner at Left of This Combination Sheet and Pair Furnace. At rear is caged ladder giving safe access to parts overhead


10-ton Powdered Coal Bin
3 ft. Cyclone
COSTELLO FURNACE
A
A
2 SLAB FURNACES
4 SHEET AND PAIR FURNACES
2 ALLIS PATENTED FURNACES
3 SHEET AND PAIR FURNACES
10-ton Powdered Coal Bin 4'-2" Cyclone.
6-ton Powdered Coal Bins 4'-2" Cyclone
No. 7 Blower, Secondary Air 7000 cu. ft. per min. at 3½ oz. pressure
-A-
No. 3 Centrifugal Pressure Blower, Primary Air 1000 cu. ft. per min. at 10 oz. press.

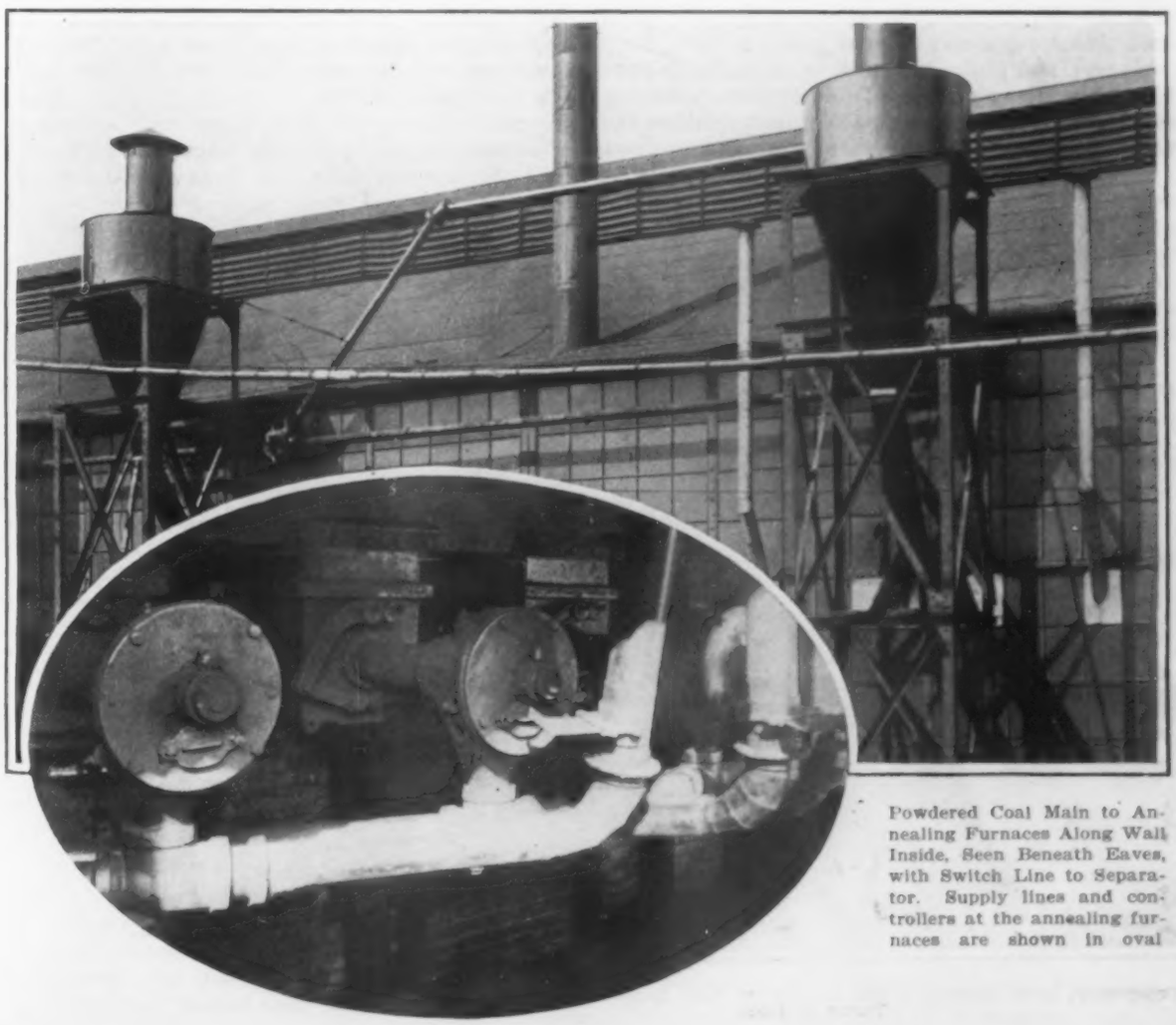
of which are supplied from four fuel bins located midway between each couple. Two have been operating with pulverized coal and the remainder are about completed and ready for substituting pulverized coal for the hand-fired method.

One Costello continuous sheet annealing furnace equipped for pulverized coal burning is about ready for operation.

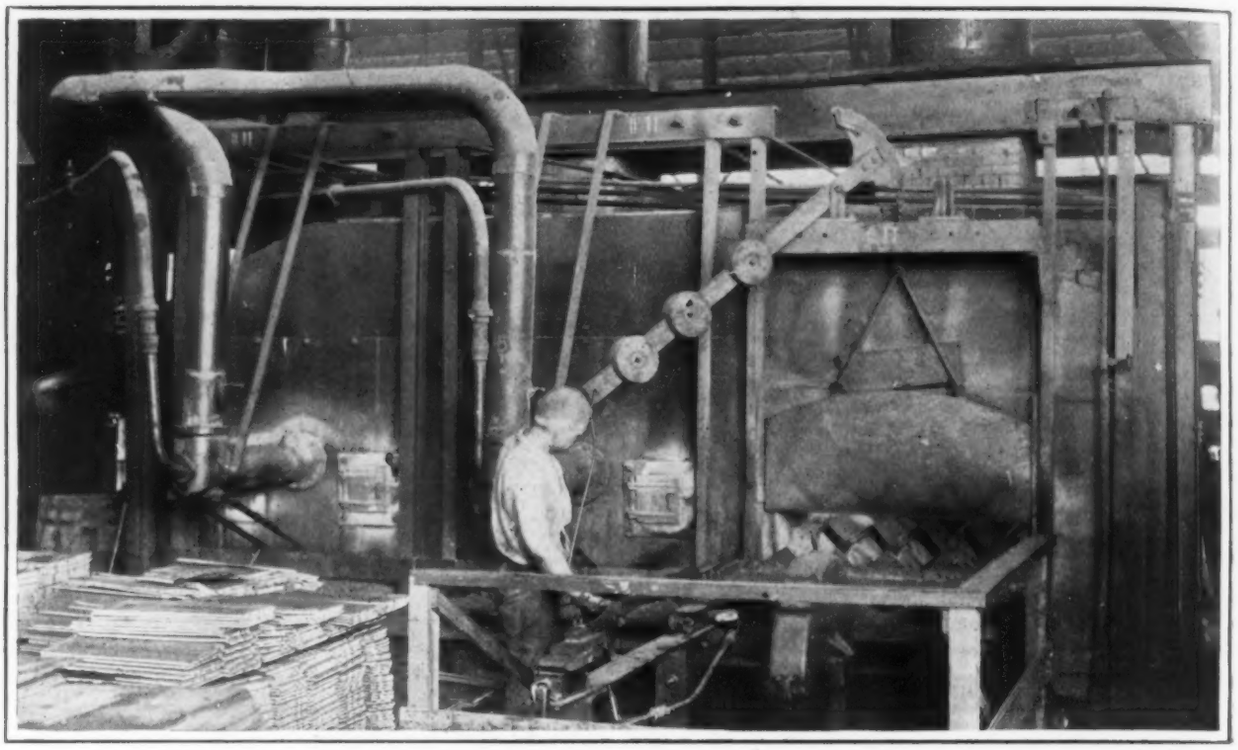
The coal milling plant is housed in a structural steel building covered with corrugated iron adjoining the power plant on the west side of the main building. It may be seen in the foreground of the general view of the plant, the three high stacks being those of the power plant. The railroad siding for delivery of coal runs through the main building to the milling plant. From the steel track hopper a steel apron conveyor with beaded flights removes the coal from the track hopper, carrying it up on an angle and discharging it into a 24-in. x 24-in. single-roll coal crusher, the discharge from which empties into the boot of a crushed coal elevator of the totally enclosed type with steel leg and single strand chain with malleable iron buckets which has a capacity of 50 tons per hr.



Powdered Coal Storage Bin with Wheel and Chain Control for Regulating Firing of Galvanizing Furnaces



Powdered Coal Main to Annealing Furnaces Along Wall Inside, Seen Beneath Eaves, with Switch Line to Separator. Supply lines and controllers at the annealing furnaces are shown in oval

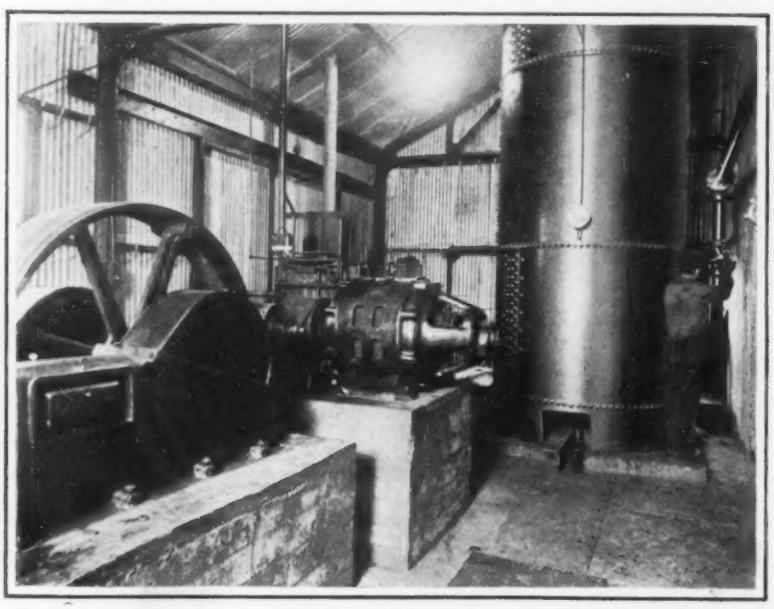


Air and Fuel Lines to Burners at the Charging End of Continuous Pair Furnaces. Peep Holes, Just Beneath Primary Air and Fuel Line at Junction with Secondary Line, Provide Facility for Gaging Combustion

The crushed coal then passes over a totally enclosed belt conveyor to a magnetic pulley, for separating tramp iron, the coal being carried from it by a 14-in. screw conveyor equipped with rack and pinion operated gates for distributing the coal to a 100-ton enclosed storage bin of steel plate construction supported by steel columns.

A rack and pinion operated grate at the bottom of this bin allows passage of coal to a reciprocating feeder driven by the same motor which operates the rotary dryer. The dryer is of the semi-indirect type with a capacity of 15 tons per hr. It is equipped with an exhaust fan which induces products of combustion from the firebox to pass through the coal which is being dried. The products of combustion are discharged into a large dust chamber equipped with baffles to remove any floating dust entrained from the drying coal. Dried coal is discharged into a screw conveyor which in turn feeds it to a bucket elevator of the totally enclosed steel leg type having a capacity of 30 tons per hr.

From the head of the elevator the coal is transported by a 12-in. screw conveyor from which it is diverted by rack and pinion operated gates to any or all of the steel plate dried coal bins, which are supported by steel frame work. From here the coal passes to any or all of the three lowside five-roller Raymond pulverizing mills of the air separation type. The coal is removed from the mills by exhaust fans and is separated from the air which conveys it by passing through cyclone separators located in the monitor of the building. A 12-in. screw conveyor collects the coal from these separators and discharges it through chutes into the 10-ton pulverized coal bin located directly above the two 5-ton blowing tanks. Each blowing tank is capable of receiving 5 tons of powdered coal at one charge. Suitable control gates operated from the floor are provided to control the amount of coal supplied for the distributing cycle.



Compressor Room Equipment and Air Storage Tank Supplying Pressure for Transport Lines

An accurate weighing device is provided for determining the amount of fuel in the blowing tank at all times, and gives the operator a check on the amount distributed to various furnace bins throughout the mill.

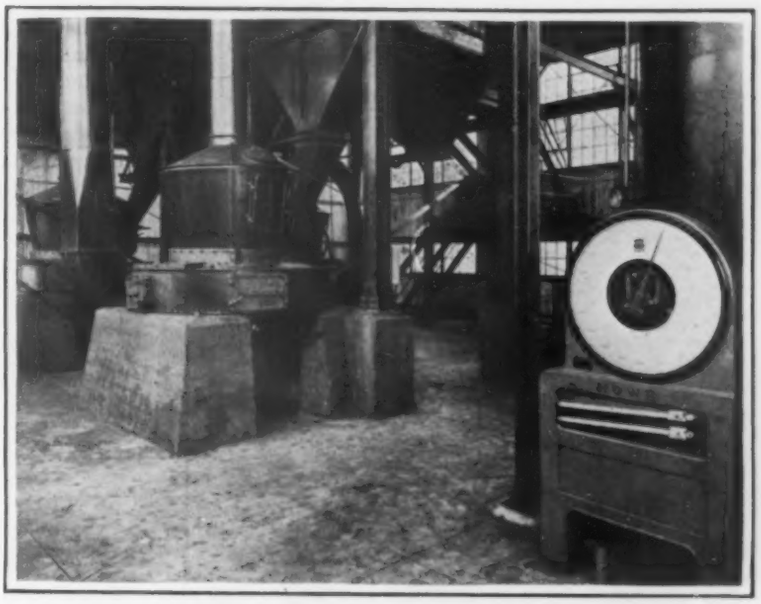
The air for transporting the coal is derived from a motor driven 12 x 7 in. x 10 in. two-stage air compressor equipped with feather type valve. Suitable means are provided for drying the air before use and the necessary receiver for storing the compressed air is located adjacent to the compressor.

The motors for the equipment in the milling plant are operated by remote push button control with au-

tomatic compensators, the push buttons being located at points convenient to the operator. The motors range from 85 hp. for operating the pulverizers down to 5 hp. for operating some of the smaller equipment.

Platforms, stairways and ladders with guards and rails are provided to give easy and safe access to all parts of the equipment.

There are four fuel transport lines, two leading from each of the blowing tanks. These lines are of 4-in. standard weight wrought pipe. One supplies fuel to bins for annealing furnaces, one leads to the bins supplying the eight galvanizing pots, one supplies the entire group of furnace bins for sheet and pair furnaces and one leads to the Costello furnace. The longest line is that supplying the sheet and pair furnaces, the farthest furnace being located approximately 1000 ft. from the milling plant.



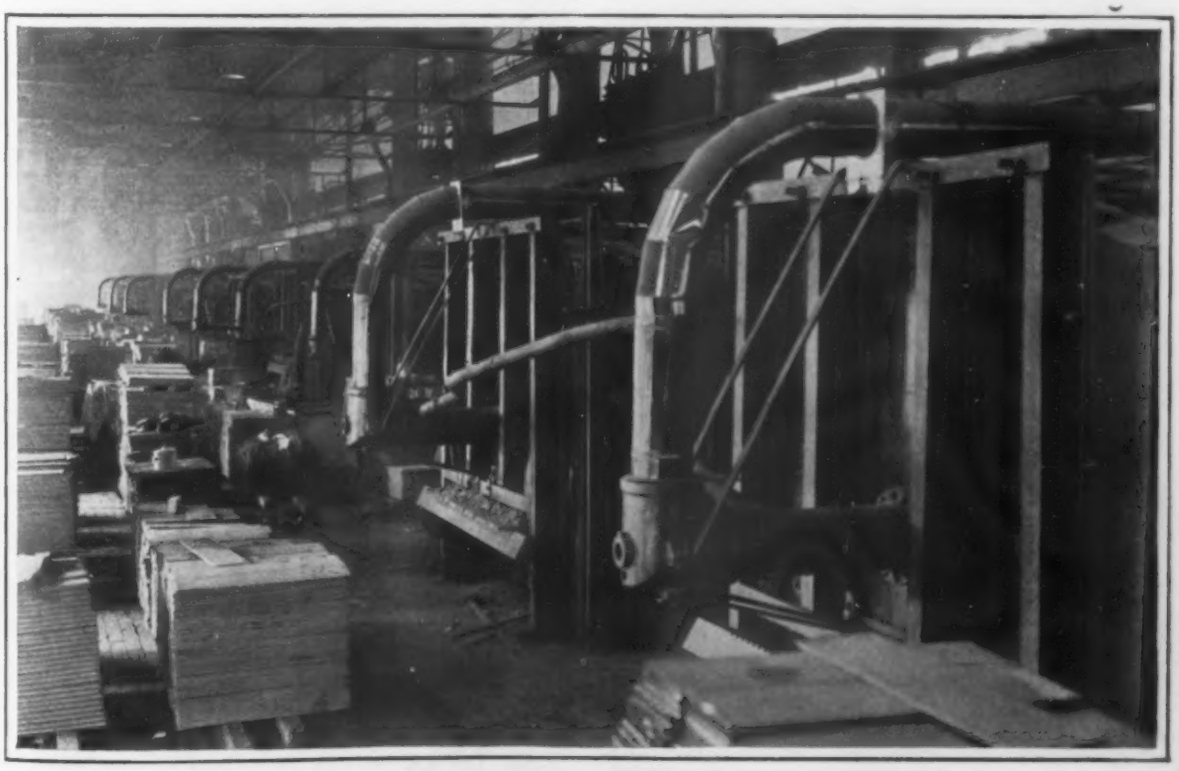
Ground Floor of Milling Plant Equipped with Three Raymond Pulverizers and Powdered Coal Storage Tank at Extreme Right

Switching valves of special design for diverting the fuel from the transport lines through collectors to the furnace bins, are located along the transport lines adjacent to the bins. These are of the double ported type and are operated from the floor by hand chains.

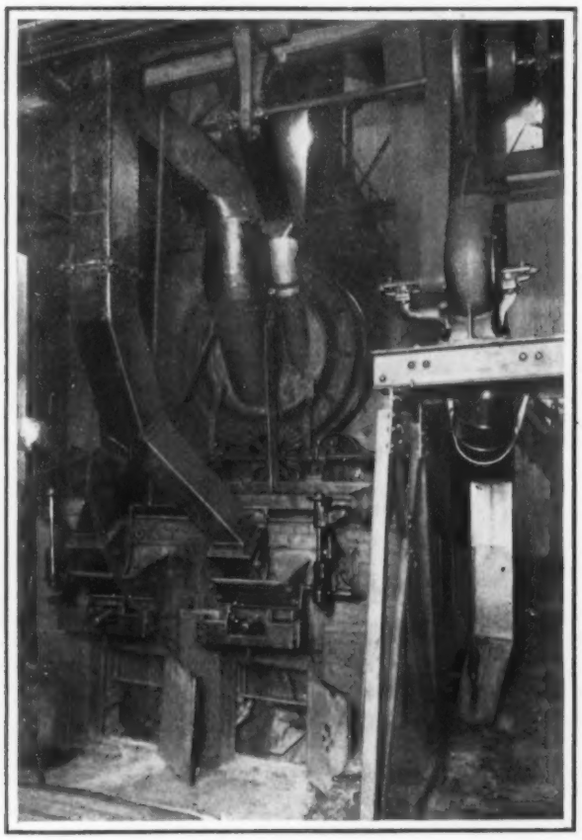
There is one bin for each group of sheet and pair furnaces, one for each annealing furnace, and one for each pair of galvanizing pots. A fuel bin gage with indicator conveniently located enables the furnace operator to determine at any time the amount of fuel available in the bin. When more fuel is required the operator at the milling plant is notified, the switching valve set for delivery to the bin and the desired amount of fuel blown through the transport line, the milling plant operator recording the amount sent. This provides opportunity for making a record of fuel consumption for the furnace or group of furnaces supplied from the bin. After the required amount has been delivered the valve is again reset to the line so that fuel can be sent to the other bins. To the bottom of each bin is attached one or more dust-tight shut-off gates. These gates are of heavy construction enclosed in a cast-iron body and are operated by hand chains from the floor.

The controller body consists of a substantial cast-iron box and discharge head, housing a feed screw which is geared to a small shaft driven at constant speed. Two shutters within the controller close over the feed screw making an adjustable opening for regulating fuel fed to the burner.

These shutters can be adjusted for any range of control between its minimum and maximum capacity. In operation, the regulation is similar to

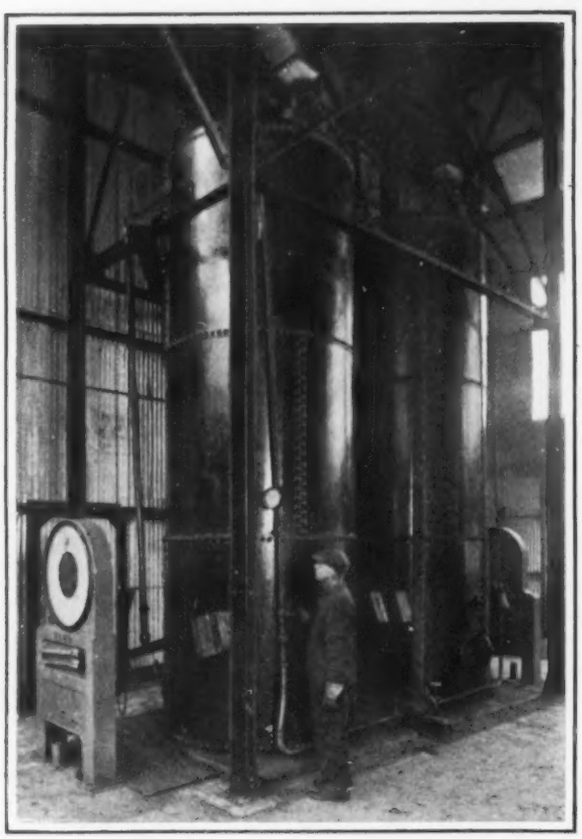


Row of 16 Sheet and Pair Furnaces, the Small Pipe Supplying Powdered Coal and Air at 10 Oz.; the Larger Pipe, Air at 3½ Oz.



Crushed Coal Introduced into Rotary Dryer by Reciprocating Feeder, Located Beside Large Exhauster Pipe, Is Dehydrated by Crushed Coal Fuel from the Same Source Supplied Through Bifurcated Chute and Fired by Blower

opening or closing of a valve, by merely turning a hand wheel, so that the operator quickly becomes proficient in its adjustment. Any number of controllers can be driven in multiple from a constant speed motor by connecting shafts or countershaft.



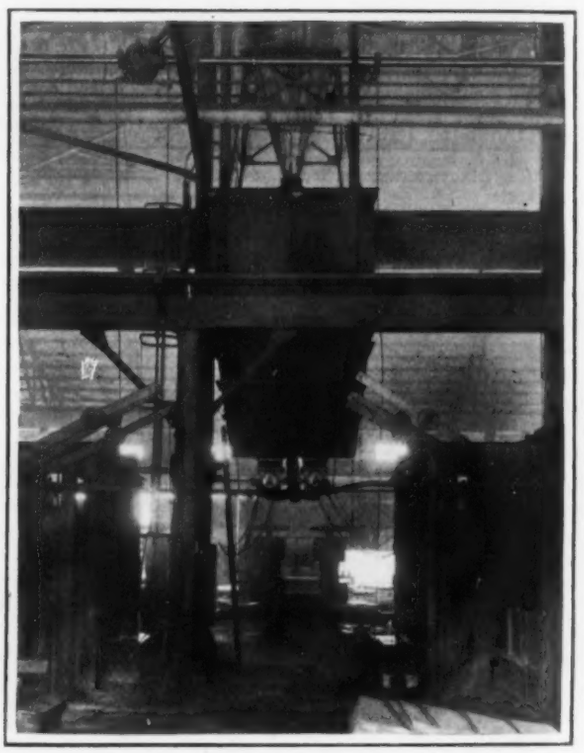
Blowing Powdered Coal from a Main Storage Tank to Bins at the Furnaces. The fuel is automatically weighed

The discharge head of the controller showers the fuel into the ejector where it is carried along by the primary air system to the nozzle of the burner, entering the burner at the back of the elbow, or through the side of the burner where space limitations have necessitated this.

The installation operates on a primary and secondary air system. The former small in volume, at less than 6 oz. per sq. in. pressure, draws the fuel from the discharge head of the controller and carries it to the burner where the secondary or combustion air in the larger volume at less than ½ oz. per sq. in. pressure is added.

The secondary air, which amounts to over 85 per cent of the total volume required for combustion, is controlled by the operator to produce the character of flame desired. Either an oxidizing or reducing flame condition can be secured at will. The nature of the flame can be readily observed through a peep hole in the elbow of the burner.

Motor-driven centrifugal blowers suitably lo-



Storage Bin and Pipe Lines to Two Combination Sheet and Pair Furnaces. Long chain at left center controls switch valve to charge storage bin. Short chains beneath bin regulate shutter valves controlling feed to furnaces

cated throughout the mill provide the necessary primary and secondary air for all departments.

The burners are of special design constructed so as to deliver the full volume of uniformly distributed air at the tip of the burner.

The following figures have been submitted as average production data attained at the plant:

On the slab heating furnaces, maximum fuel consumption of 180 lb. of coal per ton of product, though it is stated that considerably less than this amount per ton may be taken as the average run.

On the sheet and pair furnaces, fuel consumption covering long periods has not exceeded 275 lb. of powdered coal per ton of sheets produced.

On the annealing furnaces, fuel consumption using powdered coal is reported well under 170 lb. of coal per ton of sheets annealed.

On the galvanizing pots, fuel consumption below 110 lb. per ton on the average and considerably less than this average for favorable weight sheets.

A Pioneer in the Manufacture of Wire

The Passing of William E. Rice Recalls Important Steps in the Development of American Rod Mill Practice—An Early English Contribution

WILLIAM E. RICE, Worcester, Mass., president of the Washburn & Moen Mfg. Co. and president and practically sole owner of the Worcester Wire Co. until their absorption in the American Steel & Wire Co., died Dec. 2, aged 86 years. A native of Ware, Mass., Mr. Rice at the age of 18 entered the counting room of Ichabod Washburn & Co., Worcester, then the largest American manufacturer of iron wires. After seven years of training the young man formed a partnership with Dorrance S. Goddard (father of Harry W. Goddard, now chairman of the board of directors of the Clinton-Wright Wire Co.), the firm name being William E. Rice & Co., and established a factory in Holyoke, Mass. This business was absorbed by Ichabod Washburn & Moen Wire Works and Mr. Rice was made a director and an executive officer. He was also affiliated with the Quinsigamond plant (now the South works of the American Steel & Wire Co.) then building, under the name of Charles Washburn & Son, and this firm and Washburn & Moen were merged in the Washburn & Moen Mfg. Co., Mr. Rice being made treasurer. A new manufacturing site was purchased and a substantial mill and power plant were erected. In this plant was introduced continuous rod-rolling, smaller gage and longer rods being produced than elsewhere in the country. Mr. Rice visited England in 1867, and the rod-rolling system was the result of this trip. A few years later he revisited England and extended his trip to Sweden. By arrangements then made he became the first in this country to import directly Swedish rolled iron and steel.

Rod Mill Practice in the 'Sixties

Interesting facts concerning the rod mill practice of that time are contained in a historical sketch prepared in 1911 by A. G. Warren, Worcester, Mass., as the result of interviews with Mr. Rice, with the purpose of preserving in the archives of the American Steel & Wire Co.'s famous industrial museum at Worcester the story of wire manufacture at that important center. The high grade billets used at Worcester in the eighteen-sixties were about 1⅛ in. square, hammered 8 to 12 ft. in length. They were purchased from iron merchants who imported them from Sweden, and rolled to wire rods at rolling mills in South Boston or elsewhere in New England, or else they were a low grade made at Quinsigamond out of wrought iron scrap.

Billets were produced at the Quinsigamond works in the following way: Scrap iron bought from railroad companies, machinists, blacksmiths and dealers in New England and New York State and Canada was cut by power shears into small pieces and piled about 8 in. high on thin boards about 8 in. wide and 18 in. in length. By means of a long handled flat shovel the piles were deposited in hot furnaces and brought to a welding heat. Upon withdrawal the pieces of loosely welded iron were passed immediately through rolls without being hammered, for the mill did not then possess a suitable hammer. This pile of partly welded iron was reduced by repeated passes between the rolls to a billet about 1⅛ in. square, which after being trimmed at both ends was reheated in a different furnace and rolled into a No. 4 wire rod. This weighed, after clipping its ends, 20 to 30 lb. and was coiled on a hand reel. If the scrap was exceptionally clean a good billet was produced; but frequently the rods from these billets exhibited an undesirable looseness of structure, and many of the billets failed in the rolling and went to swell the scrap heap from which other billets would later be produced. The average production of billets was about 10 tons, and of wire rods about 15 tons for 24 hours of day and night turns, some rods being rolled from Swedish iron.

The increasing demand for wire in long lengths for the rapidly expanding telegraph service of the country and also for other uses could not be met with wire rods of 30 to 40 lb. weight, and American producers of wire were confronted with a serious problem. Ichabod Washburn, ever alert, discovered that England had solved the difficulty. At the works of Richard Johnson & Nephew in Manchester the manager, George Bedson, had invented, patented and built a continuous rolling mill which, together with a Siemens gas furnace, formed an equipment for rolling billets weighing from 75 lb. to 150 lb. into No. 5 rods. This was a great step in advance and the installation of such a mill in Worcester was to Mr. Washburn's mind the one thing to be desired. Accordingly, when in the summer of 1867 Mr. Rice with his family took a European trip, he was commissioned by Mr. Washburn to investigate the performance of the continuous mill and report upon the advisability of purchasing a Bedson mill and Siemens furnace. This Mr. Rice did. His report was dated at Manchester, July 15, 1867. The following are extracts from it:

The Bedson Mill in England

I have had the pleasure of making Mr. Bedson's acquaintance and seeing in operation his patent mill which rolls No. 3 wire rods from 1¼-in. sq. billets in pieces of about 75 lb. weight.

The mill, he says, works regularly night and day, turning off on an average 12 tons to a turn (24 tons per day) of beautiful rods. The rods when they leave the finishing rolls are a lighter red than those we roll at Quinsigamond. The mill is certainly a perfect success as far as No. 3 rods go. Mr. Bedson says it will roll to No. 5, but it is at work on No. 3 because they have a large order for bridge wire and the contract stipulates that it shall be drawn three holes and No. 3 is the size rod required.

This is the only mill that has been put to work, although a second mill is completed, with engine and Siemen's heating furnace, for rolling from 1¾-in. billets to No. 3 rods in 150-lb. pieces. This mill has not been put to work, as the first mill rolls all the rods their business requires, but it is for use in case the first gives out or if business improves so as to require the product of both.

It is on precisely the same principle as the first mill, but is made stronger and more symmetrical, and has two more rolls for taking larger billets. Neither of these mills is for sale, being put down by Messrs. Johnson for their own use.

Arrangement of Mill and Furnace

These are the only mills constructed for rolling from billet to rod. The rolls are all of the same size, viz.: 8 in. dia., and about 6 in. face, with one groove only, which is in the center of face of each roll. They are of chilled iron shrunk on to wrought iron spindles. Mr. Bedson says a set will roll about 400 tons of rods, when a new set is put on and the old rolls are all dressed to a uniform size and used again. It is not necessary they should be just 8 in. dia., but it is necessary the set should all be of the same diameter.

The machine is placed so that the first pair of rolls, which makes about 15 turns per minute, are 12 in. from the furnace door. The billets are about 18 ft. long, the furnaces being 22 ft. long outside. The billets are charged at the end opposite to the end where they are rolled; about eight are in the furnace at a time, one being put in as fast as one is rolled. The gas enters through apertures at one side of the furnace and the draught is through similar apertures on the opposite side. The furnace, mill and engine, taken as a whole, form the nicest arrangement for rolling wire rods that it seems possible to devise.

Rolling Smaller Rods

As to rolling to No. 8, no progress has been made with that for a number of months. Experiments have all been with a machine or mill consisting of six pairs of 8-in. rolls driven by two diagonal engines of diminutive proportions, which are attached to and form a part of the machine. This machine is placed about 20 ft. in front of a rod mill like our

Quinsigamond rod mill. The billet is rolled in the rod mill to the small square, which is about ¼ in. The end of the square rod next the small machine is quickly picked up by a sticker-in stationed there and started through a series of six pairs of rolls, the first of which has a diamond groove.

It is the only machine by which Mr. Bedson has attempted to roll smaller than No. 5. He did roll No. 5, he says, on his first mill, viz., the one which was changed to No. 3 rods and is now in operation, and subsequent attempts have been made to roll to No. 8, but at the trials difficulties were developed which have not yet been overcome.

He, however, says the principle of the machine is right, and he is sanguine that when he has time to give it he will surmount every obstacle and make it work perfectly in rolling to No. 8.

It is quite evident that by the Siemens mode of heating and the Bedson mode of rolling, billets can be converted into No. 3, and I doubt not into No. 5 wire rods for less money and in longer lengths than by our present mode. The rods must be quite as hot, too, when finished as we can get them out. Bedson saves in waste by his mode of heating, in oxidation while the billet is being rolled, and in getting off a greater production than we at the same expense for labor.

Mr. Bedson admits that billets can be heated in a gas furnace and thrown to the rolls and a saving of iron made in the heating, but we should then, of course, lose the same in oxidation while being rolled as we now do. He judges the saving he makes in waste may be one-half in the furnace and one-half in the rolls.

Long Billets Needed

The great advantage claimed for the mill is its ability to roll long lengths, which are especially valuable for bridge, rope and telegraph purposes, which constitute a large portion of Messrs. R. Johnson & Nephew's business. They manufacture large billets for the purpose of making long rods, the first mill being for billets 18 ft. long, 1¼ in. sq., and the new mill for the 1¾ in. sq. Now, we make no billets suitable for rope, telegraph or bridge wire, nor do we know where we can procure them of a good quality and of the right size. If we were making good puddle billets or cheap charcoal billets, the mill would be as valuable to us as to them, but in our present situation it is not.

No such thing is known in England as rolling scrap iron into wire rods without hammering. Mr. Bedson works piled iron, but it is all hammered, and he says there would be no difficulty in rolling sound billets in his mill If our billets are not sound, we would not obtain as good a result as he does. I have not practical knowledge to decide whether scrap billets as we make them could be rolled advantageously in his mill or not. I think, however, they can be, at least if we hammer them, which we ought to do at any rate, but to make 75-lb. pieces, we should need 1¼-in. sq. billets.

Mr. Bedson's price is £2000 sterling for a mill and engine complete for bolting down to foundation and suitable for rolling 1¼-in. sq. or 1⅛-in. sq., as we might elect, to No. 5 wire rods. It would be delivered free in Liverpool, but packing would be extra. * * * It would cost in England to construct a gas furnace about £1000, he says.

Difficulties in Worcester Practice

An order was placed in England in 1868 for the construction of a Bedson continuous mill, and it was installed at Worcester and put in operation in 1869. But the billets made at Quinsigamond from scrap iron were for the most part unfitted to be rolled in a continuous mill. Mr. Rice had feared this and had so expressed himself in his report. The difficulties encountered as time went on were so great that the further operation of the Bedson mill was endangered. This led to Mr. Rice's trip to Sweden, referred to above, and the beginning of the shipment to the United States of the softer grades of Swedish steel, as well as of iron, in the form of long billets, making it possible to operate the Siemens furnace and the Bedson continuous rolling mill.

A Good Sized Royalty

An investigation looking to the patenting in America of Mr. Bedson's rolling mill had revealed the fact that substantially the same invention had been previously patented in the United States by Joseph S. Levy (1854) and Henry B. Comer (1859). It was, therefore, necessary to purchase the Comer and Levy interests before installing a Bedson mill. The patent was purchased by Ichabod Washburn and later Comer was engaged to go to Worcester and operate the Bedson mill. The arrangement under which the Bedson mill was installed at Worcester provided that Ichabod Washburn and Mr. Bedson were to receive as royalty $1 per ton in gold for No. 5½ rods and coarser and $3 per ton in gold for finer sizes.

In 1877 Mr. Rice established the Worcester Wire Co. and upon the death of Philip L. Moen returned to Washburn & Moen and remained as president until the business was sold to the American Steel & Wire Co. in 1899, when he retired. Mr. Rice leaves a widow, a daughter, Mrs. Christine Gillett, wife of Speaker Frederick H. Gillett of the National House of Representatives, and a son, Albert W. Rice, a Boston attorney. His two granddaughters, Miss Frances H. and Miss Louisa R. Hoar, Mrs. Gillett's children, are granddaughters of the late United States Senator George F. Hoar of Massachusetts.

Seattle's "American Plan of Employment"

"The American plan of employment," another name for the "open shop," as promoted by the Associated Industries of Seattle, Wash., has attracted universal attention along the Pacific Coast. It has resulted from the general strike in February which paralyzed the principal industries of that city and threatened the city's economic destruction and the subsequent formation of the Associated Industries of Seattle to fight the radicals in industry who were striving to wrest control from their employers.

At first the Associated Industries gave the unions a chance to "clean house" and expel their radicals, but when the unions failed to do this, the organization demanded and obtained purely open shops. Co-operation was received from the Chamber of Commerce, the Rotary Club, the Kiwanis Club and all other civic and commercial organizations of the city. Advertisements were published in the leading dailies which influenced public opinion. The movement is not against unionism, but against the domination of unionism and industry by un-American radicals. The unions have now lost control in rapid succession of the building industry, the job printing industry, the merchant tailors, the dyers and cleaners, the jewelers, the shoe repair shops and the master pile drivers. Public sentiment is now strongly in favor of the open shop. San Francisco, Portland, Spokane and Tacoma have organized "Associated Industries" on the Seattle plan.

British-American Reciprocal Advertising Service

The advertising advisory committee of the American Chamber of Commerce, 8 Waterloo Place, London, S. W. 1, England, is developing a British-American reciprocity advertising information service, to supply exporters in either country with general information as to the marketing of their goods, the existing or potential demand, competition, etc., in the other country. At the moment, the committee is laying the greater stress on the development of British trade in America, because of the menace that the present row rate of sterling exchange holds for the immediate future of the American export trade. Co-operation is already pledged by the American Manufacturers' Export Association; the Associated Business Papers, Inc., New York; the American Newspaper Publishers' Association, New York; the American Association of Advertising Agencies, Cleveland; the Associated Advertising Clubs of the World, Indianapolis; the Periodical Publishers' Association; and the following leading British organizations have already signified their interest: the Federation of British Industries (Industrial Publicity Service); the National Union of Manufacturers; the Association of British Advertising Agents, and the London Chamber of Commerce.

Two sections of 2-in. extra heavy steel pipe were recently thermit welded by the Metal & Thermit Corporation, 120 Broadway, New York, for the Carnegie Steel Co., Clairton, Pa. Under pulling tests the first pipe broke 4 in. from the weld at 113,800 lb. and the second pipe broke 4⅝ in. from the weld at 124,100 lb.

Frank B. Gilbreth, consulting management engineer, Providence, has moved the offices of Frank B. Gilbreth, Inc., to 68 Eagle Rockway, Montclair, N. J.

Annual Convention of Mechanical Engineers

Elect Officers and Confer Honorary Membership on French Engineers—Sessions on Machine Design, Machine Shop and Gas Power

THAT lively interest was taken in the fortieth annual meeting of the American Society of Mechanical Engineers, held Dec. 2 to 5, in New York, was evidenced by the large attendance which was 300 more than last year. This was to be forecast by the subjects and excellence of the papers presented, the well-balanced program and the numerous social features prepared.

The opening session was held Tuesday evening, and was followed by a reception by the members to the president, president-elect, ladies and guests. The three following days were devoted to a business meeting, simultaneous technical sessions, and a session on Thursday morning devoted to "The Industrial Situation in Relation to Present Conditions," which is reported in a separate article in this issue. The members joined with other societies in a meeting on Wednesday evening to commemorate the eightieth anniversary of the beginning of Captain John Ericsson's work in this country, and the thirtieth anniversary of the death of Captain Ericsson and of Cornelius H. DeLamater, founder of the DeLamater Iron Works, where Captain Ericsson's most important work was executed. These exercises included addresses by Hon. Lewis Nixon, commissioner of public works, Borough of Manhattan; Rear Admiral Bradley A. Fiske and Hon. W. A. F. Ekengren, Sweden's minister at Washington. An illustrated historical review of the work performed at the Phoenix Foundry and the DeLamater Iron Works, was given by H. F. J. Porter.

The lectures and annual reunion on Thursday evening registered a large attendance. A lecture on the "Future of Aviation," by Col. E. A. Deeds, Dayton, Ohio, chief of Equipment Division of Air Service during the early development of the air program of the war, and a lecture on "Present Development of the Military Airplane," by Col. Thurman H. Bane, chief of Engineering Division of Air Service and commanding officer of McCook Field, proved of considerable interest. Col. Bane's lecture was illustrated by slides and moving pictures released by the War Department for this lecture for the first time.

Excursions were taken to the Seventy-fourth Street plant of the Interborough Rapid Transit Co., where a modern telephone exchange switchboard was seen in operation; to the Equitable Building, where the power plant was inspected; to the Navy Yard in Brooklyn, and to the Curtiss Aeroplane plant and flying field at Garden City.

Presidential Address

In the annual address, the president, M. E. Cooley, dean of the schools of engineering, University of Michigan, discussed the various problems of the society, and proposed a plan for federating the principal engineering societies so that the various activities might be more efficiently co-ordinated. He also spoke in favor of the plan of affiliating with local engineering societies, taking as an example the joint activity of the Cleveland Engineering Society and the American Society of Mechanical Engineers.

Fred J. Miller, the new president, was born in Ohio, in 1857. He became a contributor to mechanical journals and finally a member of the editorial staff of the *American Machinist*, where he remained for 20 years, the last 10 years as editor-in-chief and vice-president of the company.

After retiring from journalism, Mr. Miller was for nine years general manager of a group of typewriter factories, and was then commissioned major of ordnance in the U. S. Army, being stationed during most of his service at the Rock Island Arsenal, where he organized and was at the head of the Civilian Service Division of the arsenal. Afterward he was attached to the office of the director of arsenals in Washington, being assigned to duty at the Bethlehem Steel Works, and was then attached to the office of the Secretary of War. He is now a member of the Technical Advisory Committee of the War Claims Board at Washington.

Following the address President Cooley introduced Fred J. Miller, member of the technical advisory committee of the war claims board, and announced his election as president of the society for the coming year. The other officers elected were announced as follows: John Robbins Allen, director of research bureau of the American Society of Heating and Ventilating Engineers, Bureau of Mines, Pittsburgh, vice-president; Robert H. Fernald, University of Pennsylvania, Philadelphia, vice-president; Edward C. Jones, chief engineer Pacific Gas & Electric Co., San Francisco, vice-president; Alfred C. Fisher, manager and vice-president Wickes Boiler Co., Saginaw, Mich., manager; Dexter S. Kimball, Cornell University, Ithaca, N. Y., manager; Earl F. Scott, president and manager Earl F. Scott Co., Atlanta, Ga., manager, and William H. Wiley, president John Wiley & Sons, Inc., New York, treasurer.

French Engineers Receive Honors

A pleasing feature of the meeting was the conferring of honorary membership upon Charles de Freminville, consulting engineer Creusot Works, France, and the announcement of the election to honorary membership of Auguste C. E. Rateau, chairman board of directors, Rateau, Battu & Smoot Co., France. M. de Freminville first visited the United States in 1885, and on his return he was commissioned to design a new type of railway car following the lines of those used in the United States. He perfected an original type of car made almost entirely of steel which was successfully adopted in Europe. When he visited the United States again in 1898 he made an extensive study of the application of electric traction which he applied to the trains of the Orleans Railway. Again in 1913 he made a special study of the scientific organization of work-shops, and the principles which he studied here were applied to a large extent in France.

Auguste C. E. Rateau is a pioneer investigator in the field of the steam turbine and the turbo-compressor, and has been especially active in the development of turbine propulsion of battleships. In connection with the world war, he became noted for his contributions to the study of ballistics and for inventions to increase the efficiency of aeroplanes.

Business Meeting

The technical session was preceded by the business meeting on Wednesday morning. The meeting was opened by President Mortimer E. Cooley, who presented

for discussion the proposed amendments to the Constitution which are to be finally balloted on on at the spring meeting. The meaning of the word "adopt" in the amendment "The society may approve or adapt any report, standard formula or recommended practice and may print the same in the transactions" evolved considerable discussion. The speakers were quite generally in accord that the accepted meaning should include the use of the standards by the members of the society. Further amplification of the wording was deferred, however, until such time as the by-laws are under consideration.

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In answer to questions Mr. Lord explained that he was not prepared to say whether the compressor would successfully handle heavy oils. Also that because of the large capital that would be required to manufacture these machines for the various purposes to which they are applicable, the Research Engineering Co. is not manufacturing but is granting rights to manufacture compressors and is acting in an advisory capacity.

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Mechanical Engineers View Labor Situation

American Society Considers Causes and Remedy of Unrest, Wage Payment, Systems for Mutual Control of Industry, and Profit-Sharing

"THE Industrial Situation in Relation to Present Conditions" was the topic which occupied one of the sessions on Dec. 3 of the American Society of Mechanical Engineers at its fortieth annual meeting in the Engineering Societies Building, 29 West Thirty-ninth Street, New York, from Dec. 2-5. The universal interest in this live subject was evidenced by the large attendance which packed the main floor of the assembly room with its capacity for about 700. The subject was presented from several angles, one of the speakers having been connected with the Department of Labor, another is head of the National Industrial Conference Board, a third is a Middle Western university professor, and the fourth a consulting engineer. There were three platform speakers who took part in the discussion which followed, one of whom is a prominent Englishman in labor councils. The society by resolution took a formal stand as to the method by which the present industrial unrest problem should be dealt with. The other sessions of the annual meeting are treated elsewhere in this issue.

Causes of Industrial Unrest and the Remedy

The first speaker was Frederick P. Fish, chairman National Industrial Conference Board, Boston. His subject was "The Causes of Industrial Unrest; and the Remedy." He said he deplored the present friction between labor and management (he doesn't like to use the word "capital") at the very time when the utmost efficiency in production and distribution is essential. "I believe the situation is far worse than seems to be the case," he stated.

In one plant, regarded as typical, he found that wages had increased 110 per cent since 1914, the cost of living only 75 per cent, while the efficiency of the workmen had decreased 40 per cent during the same period. "For the moment, at least, owing to the abnormal situation throughout the world, the employers are able to add to the price of their manufactured articles enough to make up for this absurdly unnecessary and vicious added cost of production, so that the public pays the bill. But the time is surely coming when our industries will be unable to recoup themselves in this manner, with a resulting period of industrial depression which may well be the most serious in history."

Among the causes for the present evils was the failure of management to correlate industrial progress with the public interest. Management did not give sufficient attention to the conditions under which men work; the fundamental law of supply and demand was neglected; the employer hired any man at his gate, rather than studying that man's qualifications and placing him accordingly. Attention to such details would have prevented dissatisfaction on the part of the workmen.

Proper Public Sentiment a Check Against Unionism

Twenty years ago, Mr. Fish asserted, instinct prompted the public to attack big business. The same instinct should now be directed toward the danger of improper and brutal power of the labor unions. "If public sentiment is at once aroused," he said, "the end is certain." He stated that the labor unions have no present grievance but are simply taking advantage of the condition of dissatisfaction and mental disturbance on the part of the wage earners. "If they succeed in their efforts the result will surely be inefficiency of production, inharmonious employment relations and the possibility of even worse developments along the lines of the aspirations of those who would destroy our civilization and our Government.

Mr. Fish said that of the 450,000 industrial establishments in the country 98 per cent are so small that it is still possible for the old-fashioned personal contact between employer and employee to continue; where a plant is too large, some good substitute plan should be inaugurated. The law everywhere should be amended so that the labor unions should surely be responsible for their acts and their contracts. The matter is of less importance if only the open shop can be maintained in full vigor.

"There is no panacea by legislation, nor by revolution. Each employer must study his own problem. Instead of looking for panaceas, employers must realize their workmen are individuals like members of their own families or their neighbors."

Terms in Controversies Need Definition

A. L. De Leeuw, consulting engineer and designer of machine tools and labor-saving devices, spoke on the subject, "Wage Payment." In brief, he called attention

for discussion the proposed amendments to the Constitution which are to be finally balloted on on at the spring meeting. The meaning of the word "adopt" in the amendment "The society may approve or adapt any report, standard formula or recommended practice and may print the same in the transactions" evolved considerable discussion. The speakers were quite generally in accord that the accepted meaning should include the use of the standards by the members of the society. Further amplification of the wording was deferred, however, until such time as the by-laws are under consideration.

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Mechanical Engineers View Labor Situation

American Society Considers Causes and Remedy of Unrest, Wage Payment, Systems for Mutual Control of Industry, and Profit-Sharing

"THE Industrial Situation in Relation to Present Conditions" was the topic which occupied one of the sessions on Dec. 3 of the American Society of Mechanical Engineers at its fortieth annual meeting in the Engineering Societies Building, 29 West Thirty-ninth Street, New York, from Dec. 2-5. The universal interest in this live subject was evidenced by the large attendance which packed the main floor of the assembly room with its capacity for about 700. The subject was presented from several angles, one of the speakers having been connected with the Department of Labor, another is head of the National Industrial Conference Board, a third is a Middle Western university professor, and the fourth a consulting engineer. There were three platform speakers who took part in the discussion which followed, one of whom is a prominent Englishman in labor councils. The society by resolution took a formal stand as to the method by which the present industrial unrest problem should be dealt with. The other sessions of the annual meeting are treated elsewhere in this issue.

Causes of Industrial Unrest and the Remedy

The first speaker was Frederick P. Fish, chairman National Industrial Conference Board, Boston. His subject was "The Causes of Industrial Unrest; and the Remedy." He said he deplored the present friction between labor and management (he doesn't like to use the word "capital") at the very time when the utmost efficiency in production and distribution is essential. "I believe the situation is far worse than seems to be the case," he stated.

In one plant, regarded as typical, he found that wages had increased 110 per cent since 1914, the cost of living only 75 per cent, while the efficiency of the workmen had decreased 40 per cent during the same period. "For the moment, at least, owing to the abnormal situation throughout the world, the employers are able to add to the price of their manufactured articles enough to make up for this absurdly unnecessary and vicious added cost of production, so that the public pays the bill. But the time is surely coming when our industries will be unable to recoup themselves in this manner, with a resulting period of industrial depression which may well be the most serious in history."

Among the causes for the present evils was the failure of management to correlate industrial progress with the public interest. Management did not give sufficient attention to the conditions under which men work; the fundamental law of supply and demand was neglected; the employer hired any man at his gate, rather than studying that man's qualifications and placing him accordingly. Attention to such details would have prevented dissatisfaction on the part of the workmen.

Proper Public Sentiment a Check Against Unionism

Twenty years ago, Mr. Fish asserted, instinct prompted the public to attack big business. The same instinct should now be directed toward the danger of improper and brutal power of the labor unions. "If public sentiment is at once aroused," he said, "the end is certain." He stated that the labor unions have no present grievance but are simply taking advantage of the condition of dissatisfaction and mental disturbance on the part of the wage earners. "If they succeed in their efforts the result will surely be inefficiency of production, inharmonious employment relations and the possibility of even worse developments along the lines of the aspirations of those who would destroy our civilization and our Government.

Mr. Fish said that of the 450,000 industrial establishments in the country 98 per cent are so small that it is still possible for the old-fashioned personal contact between employer and employee to continue; where a plant is too large, some good substitute plan should be inaugurated. The law everywhere should be amended so that the labor unions should surely be responsible for their acts and their contracts. The matter is of less importance if only the open shop can be maintained in full vigor.

"There is no panacea by legislation, nor by revolution. Each employer must study his own problem. Instead of looking for panaceas, employers must realize their workmen are individuals like members of their own families or their neighbors."

Terms in Controversies Need Definition

A. L. De Leeuw, consulting engineer and designer of machine tools and labor-saving devices, spoke on the subject, "Wage Payment." In brief, he called attention

to the fact that the main terms in controversies between capital and labor are ill defined or not defined at all. There is at present no equitable way of determining wages and, as a result, there is no possibility of collective bargaining. Wages are at the present time paid for time given, whereas they should be paid for work produced. Employers alone cannot correct this condition, but employers and organized labor together, assisted by qualified engineers, might go far in correcting this unsatisfactory condition of wage payment.

The speaker said there was confusion as to the true meaning of "capital." Neither capital nor capitalists are themselves at fault; it is rather the danger from the control of capital. "Capital being the tool with which labor must work, it is but natural that labor should look with suspicion on an attempt to corner the tool supply."

"What is really meant by the 'right to organize' is that the employer shall give, not to his men, but to some labor union, the right to come into his shop and organize his men into a union; and apart from the question as to whether this is desirable or equitable, it is certainly different from the idea which the expression, 'the right to organize' conveys."

Collective Bargaining Has Been Only "Collective"

Speaking of collective bargaining Mr. De Leeuw said: "So far collective bargaining has been collective, it must be admitted, but it has not been 'bargaining'." He said that strikes, or threat of strikes, are no more a method of bargaining "than when a man points a gun at his debtor to collect a bill." Another striking statement was: "It is true that labor is sold by the hour, but the hour is a measure of time, not of labor. We might just as well sell eggs by the yard, and without even specifying whether we lay them lengthwise or crosswise.

"This inability to strike a bargain because the value of the product to be sold is entirely unknown, is, in my opinion, one of the greatest difficulties to be overcome before there can be an equitable adjustment of the differences between employer and employee. To sum up, the pure wage system is not bargaining in any sense of the word; the piecework system is only bargaining if employer and employee have reached an agreement, and if there is some mechanism by which this agreement can be changed as soon as conditions change; the pure bonus system is nothing else but a wage system with a kind of profit-sharing plan; the task-and-bonus system, if properly worked out and if accompanied by complete instructions to the employee, is a perfect bargain, but must be constantly revised as conditions change. However, the last-mentioned system carries with it the necessary mechanism to effect these changes. It is my opinion that the ultimate solution of labor trouble must be based on some method of bargaining, probably collective."

Unions Are Destructive Rather Than Constructive

He said that heretofore the labor union was a war organization to fight the employer, whom he regarded as a natural enemy. "The unions, so far, have not offered any constructive suggestion, and this cannot be expected from a fighting organization.

"Taking the aims of organized labor to be: Proper share of the proceeds of labor, reasonable working conditions and working hours, right to organize and collective bargaining, I believe that these aims could all be accomplished without strife if the last item were put into actual practice instead of being a mere catchword. If employers and employees together would put as the first item in their catechism the truth that the world must produce more in order to have more; if employer and employee together would try to find an equitable way of estimating the value of work done; if both would subscribe to the truth that no permanent gain can be made by wearing out a man's capacity for work nor by allowing him to work less than he should for the good of the world at large; if then employers and employees together would organize a bureau of research for defining the conditions under which the various classes of work should take place; and if finally an attempt were made by both employers and employees to classify men according to their natural or acquired ability, there would be very little reason left why a union should be a fighting organization.

"It is my belief that the crux of the solution lies in the establishment of a proper wage system, and that in order to establish such a system the engineer must come to the assistance of labor in order to find standards of value for work done. It will be found possible to classify a large portion of the work of the world in such a manner that wages can be set to such a degree of scientific accuracy that the variations caused by the disturbing facts will not be so large but that they will lend themselves to compromise."

Representative of the Clothing Industry Talks

William L. Leiserson, formerly chief, Division of Labor Administration, Working Conditions Service, United States Department of Labor, was unable to be present, though his paper was read, the subject being: "Systems for Mutual Control of Industry," and pertaining to the clothing industry with which he has been identified. He presented his thoughts rather from the standpoint of organized labor. He said that the transition in the attitude of the employer toward the workman from that of a hireling to that of a business associate seemed very radical. It is hard for the employer to look upon him other than as one who must obey his every command. He thought there was more danger from Bolshevism because of the actions of employers rather than because of those of employees. Employers and employees must both be servants of the public, he said.

He mentioned three systems for the mutual control of industry: The shop committee proper, which involves no collective bargain, its functions being merely advisory; the employers' unions; and the ordinary labor unions. In the clothing industry there are 200,000 people employed, in which both sides are organized—and there cannot be true collective bargaining unless both sides are organized, he said. As a result of this method of getting together, strikes have been declared illegal; the employers have been taught to respect labor leaders, and vice versa. Both sides work together for the elimination of strikes, for the invention and installation of labor-saving devices, for time studies and increased production. The unions have been peaceful and are not the "fighting organizations" described in a previous address.

Profit-Sharing Should Be Applied to Salaried Class

The last scheduled speaker of the forenoon was Ralph E. Heilman, dean of the School of Commerce, Northwestern University, Chicago, whose subject was: "What May We Expect of Profit Sharing in Industry?" He told of the early experiments in profit sharing in the '70's, which were later abandoned and regarded of further interest only to theorists. Within the last year or two, however, it has been revived in practice. It may be defined as "An agreement whereby labor shares in the business as a whole or in some unit of the business."

Mr. Heilman gave four reasons why it might be adopted by an industry: To increase effort on the part of the workman; to promote the permanency of the workman in his position; to promote industrial peace (but the speaker thought its possibilities in this respect had been greatly exaggerated, as it often gave additional cause for strife over the percentage of profits to be shared); to remedy the defects of a flat salary.

He said that the last reason was the most important, in his opinion, though the least mentioned. "We are just beginning to realize the defects of a flat salary," he stated. "It doesn't draw forth the best in a man. The hope of advancement in position operates weakly and these advances do not come fast enough. How, then, shall we pay those hired to manage industry? By profit-sharing."

The speaker said he favored the application of profit-sharing to the upper, intelligent classes in an industry; in other words, to the persons who are in a position to bring about increased production through their efforts. It is hard, for instance, to make an elevator man realize the importance of increased production.

The speaker named over manufacturing companies which have this scheme of profit-sharing among the salaried employees, including the Studebaker Corporation, the Semet-Solvay Co., the Fort Wayne Rolling Mill Works and the American Rolling Mill Co. Profit-sharing is effective in direct ratio to the rank of the employees and in inverse ratio to the numbers to whom it applies. The higher class more gracefully accepts periods of depression, while the lower class becomes suspicious and restless when wages are less bounteous because of this depression.

The speaker claimed that profit-sharing ought to be tried out among small groups; that everywhere it had been abandoned a large number of "the rank and file" of workmen had been included. Profit-sharing, he concluded, is not a panacea, but is an improvement where used wisely and not too widely.

British Student of Labor Leads Discussion

Hon. George M. Barnes, a representative of the British Joint International Labor Conference and a representative of Great Britain at the peace conference at Versailles, spoke in the discussion. He said that when he visited the United States about 20 years ago the slogan of a certain political campaign was "the full dinner pail." To-day the workman has passed the purely material stage and has become a thinking man, and we are now concerned with the proper guidance of his mind. The question now is: "How can we utilize the knowledge the workman now has?" In regard to profit-sharing he stated: "I don't think it will work unless it does away with the splitting up of workers into groups."

Henry Hess, Hess-Bright Mfg. Co., Philadelphia, read a paper and Harry Alexander, contracting engineer, 20 West Thirty-fourth Street, New York, read a paper in conjunction with a slide on the screen devoted to one plan of profit-sharing.

Society Takes Official Stand on Industrial Unrest

The following resolution, passed by the executive committee of the New York section of the society, was brought before the forenoon session and discussion carried over in the afternoon session:

Resolved, That the minimum essentials for industrial peace as set forth in the accompanying statement are approved; and further,

Resolved, That the council of the American Society of Mechanical Engineers be requested to bring this statement to the attention of the other sections of the society for consideration and action; and be it further

Resolved, That the executive committee of the New York section be requested to make such other proper use of this statement as may aid engineers or others in their consideration of industrial unrest.

The text of the declaration is as follows:

Social and industrial unrest result from the fact that human relations have not kept step with economic evolution.

Competent directive management of essential enterprises is the logical solution. Such management must be free from autocratic control, whether by capital or by labor.

Sharp social or industrial disputes are no longer private. Society is affected, therefore such cases must be subject to the decision of authorities based upon intrinsic, not arbitrary law.

Industry and public utilities must serve the people. There is no room for special privilege of capital or of labor. Strikes, irregular employment, or arbitrary acts of ownership or of management are harmful, not alone to the immediate parties but to society as a whole.

Productivity and public service are absolutely essential.

On account of the peculiarly intimate familiarity of engineers with industrial problems our responsibility is great.

Therefore, we, engineers and members of the New York section of the Society of Mechanical Engineers, declare that the following essentials are established by facts and experience, urge all of our members to uphold them, and invite other engineers to co-operate with us in having them unanimously recognized, viz.:

Every important enterprise must adopt competent productive management, unbiased by special privilege of capital or of labor, and disputes must be submitted to authorities based upon intrinsic law.

Credit capital represents the productive ability of the community and should be administered with the sole view to the economy of productive power, that is, it should be granted only to those who are able to render valuable service.

Taking action in compliance with the intent of this resolution, the executive committee of the New York section hereby refers this declaration to the president and council with several requests in keeping therewith.

The responsibility of the engineer for the proper utilization of the agencies of productivity, and his relations to these agencies, makes consideration of them of interest and importance to our society as a whole, and discussion of these subjects is wider than a section activity. To establish the means for enlightening our members in regard to these matters this suggestion is offered:

That a committee on agencies of productivity be established, with sub-groupings to study among others these major agencies: 1. Invested savings. 2. Credit capital. 3. Organized labor. 4. Unorganized labor. 5. Employers. 6. Managers. 7. Society as a whole. 8. Economic and productive intelligence service.

As the major intent of the declaration is to call attention to the need of competent direction of the agencies of productivity (direction which in a large measure must be furnished by engineers), it seems proper to suggest that the council might urgently advise the United States Council of National Defense, which is about to be reorganized, to undertake the direction of the agencies of productivity to meet the great needs of society, a function that was imperfectly exercised during the period of the war.

And further, we would urge, so far as is proper for us to do, that the council prepare and transmit to the President's second Industrial Conference a strong declaration embodying the engineers' convictions in regard to the causes of industrial unrest and the principles upon which a remedy therefore must be based.

Foreign Needs of American Goods

The opportunities of Americans for trade with 27 foreign countries are outlined in a pamphlet issued by the Guaranty Trust Co. of New York, entitled "American Goods and Foreign Markets." Many of the facts were presented at the International Trade Conference at Atlantic City in October, where many countries were represented. It was emphasized at the conference that approximately $1,500,000,000 will be asked from American investors during 1920 by France, Italy and Belgium. It was suggested that the United States Government make a move toward international financing, thus stimulating private investors. "Governmental co-operation might be had through some semi-official public agency, such as the Federal Reserve Board or an organization similar in makeup and powers, if not in scope, to the organization which sold the Liberty Loan issues during the war."

The following are the facts, in brief, of interest to steel and machinery interests, as contained in the pamphlet. Belgium is adopting much labor-saving machinery, most of which would be bought from America but for exchange conditions, which direct purchases to Germany. In Canada the national railroad recently received 100 new steel passenger cars and much steel equipment is under construction. Several large cargo steamers are being built in Montreal for French account.

The most pressing needs of China are the great extension of railway lines and the development of the mineral wealth of the country. There are plans for the development of the iron and coal fields in Shansi and the construction of steel works. "The most promising market to-day appears to be that for American machinery and metal products." Because of the addition of 14 per cent to her railroad mileage Denmark will require an extra 50 locomotives, 150 passenger cars and 1000 freight cars. The railroads will have to be enlarged in Finland.

The only real needs of metals by France the coming year will be confined to 100,000 tons of ship plates and about 90,000 tons of copper in bars and ingots. France will not only be able to meet all her domestic steel requirements, but also to produce an exportable surplus of about 2,000,000 tons. In Great Britain the John Lysaght, Ltd., iron and steel works, was recently purchased by H. Seymour Berry, of Merthyr Tydvil, in conjunction with D. R. Llewellyn and Lady Rhondda (as previously reported in THE IRON AGE). The combination already possesses iron and steel works, an up-to-

date rolling mill, coal mines and interests in Australia, besides shipping interests. Harland & Wolff of Belfast, Ireland, usually called the biggest shipbuilding concern in the world, are reported to have acquired the large shipbuilding yards of D. & W. Henderson, Ltd., and A. & J. Inglis, Ltd., on the Clyde at Glasgow.

Besides agricultural machinery, Italy needs 605 000 tions of metals annually for the next five years, including ingots, semi-finished steel, pig iron, plates, shapes, rails, scrap iron, tin plate, copper and other metals. The Fiat Co., the largest Italian automobile manufacturer, has purchased a controlling interest in the Alpine Montan Gesellschaft, the Austrian company which dominated the steel production of Eastern Europe. Among the imports sought by Persia are tools and implements.

Construction of one railroad is about to be started in Peru and negotiations are being pushed for another. Meter gage may prevail due to the alleged greater cost of standard gage. There is a great shortage of railroad rolling stock in Rumania and the government will be obliged to purchase large quantities in the future. In the first quarter of 1919 the United States held 27 per cent of the foreign business with Siberia, nearly all the exports being railroad supplies. In that country there is an existing market for 582,000 pieces of American-made agricultural machinery. In Venezuela there are excellent opportunities for the establishment of iron and steel foundries.

The Fall in Foreign Exchange

How It Unfavorably Affects the American Manufacturer — Resort to Barter Is Advocated and Explained

BY STERLING H. BUNNELL*

THAT the pound sterling, once equal to $4.866, is now worth only about $4.00, and is likely to fall further, is no mere Wall Street incident. It means that every British purchaser of an American article which at normal exchange would cost him 16 shillings, must pay nearly 20 shillings for it. This increase in price does not help the American manufacturer in the least. It is not, as some uninformed Congressmen and others have imagined, a profit to the bankers, or any sort of a graft or extortion by anyone concerned. It does no one any good (except chance speculators who sold sterling short, expecting to buy later when exchange should have fallen further), and it works very great temporary hardship. It reduces the sales of American goods in the United Kingdom exactly the same as an equivalent rise in price.

Similar but greater hindrance to our export trade results from the fall in the French franc from 19.3 cents to 10 cents, making the French purchaser pay almost double for American goods. The Italian lira is down from 19.3 cents to about 8 cents. The German mark at 2¼ cents multiplies the cost of American goods in Germany more than 10 times. All these figures work both ways. For instance, if German goods were now allowed to appear on our markets, they could be sold at prices one-tenth of normal. The highest protective tariff figure ever attempted could not keep them out.

The result to-day is that American export trade is being strongly repressed, and import trade correspondingly stimulated. Since Europe needs our goods in enormous quantities, various plans are being brought forward to force up the exchange rates. All of these are based on some form or other of loans, which means that Europe undertakes to earn and save in the course of time by trade and industry the equivalent of the dollars needed now. As there is a limit to the speed at which goods can be bought, delivered and transported, a large credit would provide for the export of American goods to Europe for a number of months, and be of important benefit to American industry.

Credit a Temporary Palliative

The greatest possible credit, however, can have but a limited and temporary effect. For one thing, the needs of Europe in food, clothing, leather, coal and raw materials, and above all, agricultural machinery to increase food production and end famine conditions, run into uncounted billions. A loan of two or three billions has been suggested by the visiting financial commission from Great Britain, Belgium, France, and Italy, but that is a small fraction of the amount urgently needed by Europe. Foodstuffs alone are short in Europe to-day to the extent of more than half of the normal annual European crop, due to reduced agricultural acreage and effort, extremely bad weather conditions, and the total absence of the enormous Russian grain surplus which formerly provided 30 per cent of the food of western Europe. Figures compiled by Richard Martens from private and public sources covering the entire world, show that the cost of the quantity of foodstuffs required to make up the deficiency and carry Europe through to the next harvest on former peace-time rations reaches the stupendous total of twelve billion dollars. There is not over one-third of the required amount of food available for import into Europe, and the difference spells famine, with social disturbance and further reduced production to follow. As none of the countries engaged in the war has yet been able to arrive at any scheme of raising revenue sufficient to pay the annual expenditures of its government, the financial outlook is not encouraging. There is every reason to expect a continued fall in foreign exchange, and a period of years during which no man will know what his country's money will be worth by the time his orders for foreign goods are delivered.

Barter Must Be the Recourse

The only possible answer is the development of international trade without the use of money. Foreign exchange, and the payment of foreign bills through banks, are modern innovations. Trade was carried on for ages without the use of any such artificial standard as a national currency. Peddler, caravan, and ship started out with loads of goods, traded them for other goods and brought these back home for sale. The exporter had to be also an importer. No goods were sent to any country which could not provide a return cargo. No prices were quoted in advance for goods to be delivered at destination. Each journey or voyage was a separate transaction. Whether the result was a profit or a loss depended on the judgment and actions of the leader, or ship's captain, or supercargo. Commonly every man concerned in the expedition shared in the net profits, which were generally large, and were not, as at present, divided up among export and import commission merchants, freight brokers, shipping companies, and the host of other agencies which have subdivided the business in these days of specialization.

In the confusion of international finance to-day, the tremendous needs of Europe are going unsupplied, while exporters crowd each other for shares in the limited and highly competitive markets of South America, Africa, and China. It is useless to quote American dollar prices to European countries, because the only people there who have money are a few war millionaires ready to pay any price for imported luxuries. The total of such funds available is, however, very small. Meanwhile, a few men with courage and enterprise are making money by trading. Their method is to put their small funds into desirable necessities and take the goods into the Near East for sale. With whatever sort of currency they obtain from the sale, they buy local

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goods for export, and ship them away for sale or further exchange. The business is generally small in the case of any one man, but is likely to be very profitable. It goes on entirely independent of currency fluctuations.

Method of Carrying on Trade

The same primordial method must be adopted by American manufacturers if trade with Europe is not to shrink and social chaos follow. It is not necessary for a manufacturer to take pay for his products in European raw materials; in fact, very little such simple exchanging can be done. But a group of Americans can provide credit and supply a cargo of useful goods to be sent to Europe. The goods can be sold on arrival and the proceeds put immediately into any available goods for export. These in turn can be sold, if necessary, in a third country, and so in time the circuit will be completed and a shipment brought home to the United States which will sell here with a liberal profit to all concerned.

Everyone who has been in Europe recently knows the scarcity of manufactured goods in every country, and can name a host of articles that would sell on sight. Return cargoes can be had in most countries in sufficient quantity to start trade and local industry. The important thing is to act promptly. Credits will be needed to carry Europe through the crisis of the year to come, but the need is so great that all possible methods must be utilized together; beside which, trade and industry, not borrowing alone, can save Europe from destruction.

Action Should Be Prompt

The food shortage in Europe will cost the lives of millions of children before the next harvest, and cause the death or permanent enfeeblement of millions more of the people. At best, the end of the winter will find part of the seed grain eaten, farm implements a year older and more worn, and human energy and courage reduced. The disaster will grow for more than one year to come, unless America provides Europe with the equipment of implements and machinery necessary to restore the production of food, fuel, and clothing. Instead of waiting for exchange rates to rise—which will take a very long time—or for millions of bonds to be projected, printed and sold, manufacturers in the United States should act for themselves. The method is to put their stocks of such articles as are urgently required into Europe, thus enabling their foreign agents to make advantageous bargains for exportable goods. Money in Europe is too plentiful, and goods, except some local raw materials, are scarce; so that much more can be bought with a pair of shoes than with their normal value in paper currency. Instead of a close export margin of profit of 5 or 10 per cent, much larger returns can be had by the trading method, and Europe will be saved from idleness and anarchy.

The Eight-Hour Day in French Industry

Serious Dissensions in Both Employers' and Workers' Organizations in Iron, Steel and Engineering Trades

(*Special Correspondence*)

PARIS, FRANCE, Nov. 20.—The great expectations entertained after the signing of the national agreement in the French iron and steel and metal working industries, expectations which I pointed out in my letter of May 9, have not been entirely fulfilled. Strange to say, the success of the new policy in our industrial organization has been, on the whole, much more satisfactory in the industries which have followed the lead of the metallurgical industry in adopting it, than in this industry itself. Since May 1, many agreements have been arrived at, either of a national character (as in the building trades, the printing trades, etc.), or of a local character (as in the textile industry of the north of France), the working of which has led to few difficulties. Such has not been the case with the metallurgical industry.

Against the union of the iron, steel and engineering industries, whose delegates had signed the agreement on behalf of the employers, the syndicate of the employing engineers, boilermakers and founders of France, once a member of the employers' union, entered a violent protest, denouncing the agreement in a public letter, portions of which were calculated to react on all the signatories of the agreement.

Just at the time when a part of the employers thus threw out the agreement because there was too much in it, the extremist section of the men's federation appeared inclined to throw it out because there was too little in it. The policy of most of the Parisian branches of the workmen's federation was to use the agreement as a means to get satisfaction for all their claims, even those which were outside of, or even against, the provisions of the agreement. For instance, after taking their stand on an agreement the aim of which was the introduction of the 8-hour day or 48-hour week in the metallurgical industry, the Paris metal workers' union asked first of all for a 44-hour week.

The strike broke out June 2 and soon involved more than 100,000 men. However disastrous it was for all the metallurgical industry in Paris and its surroundings, it was much more dangerous from a social and political point of view. It was not a contest between the two organizations which had prepared and signed the agreement, but between the local employers (many of whom, by the way, belonged to the syndicate of the engineers) and a committee made up from the men's local unions, more or less in rebellion from the beginning against the leadership of the officials of the federation.

After some days the strike, which up to that time had kept a trade character, showed an increasing tendency to become a political movement. Under the influence of the extremist section of the men, the strikers, of whom tens of thousands had entered the union since the stoppage of work and who had no idea of unionist discipline, unable to compel the employers to give way, declared war on the social organization of France. After failing to get the workers' federation to declare a national strike in the metallurgical industry, the new leaders turned to the cartel (an organization set up after the British triple alliance, but by seven trade federations instead of three), seeking to have a general strike, or revolutionary movement, declared by this organization. The cartel on June 24 resolved that "an immediate general strike was materially impossible to help the strikes now going on, and chiefly the strike of the metallurgical industry in Paris and its surroundings."

Shortly afterward the strike collapsed altogether and the men resumed work. In a few shops advances in wages had been granted in the first days of the struggle. Of course the 44-hour week had been refused everywhere.

During the second part of the strike the officials of the workers' federation were constantly and violently abused, certainly more than the employers, by the extremist section. They were impeached before the convention of the Metalworkers' Federation, which was held in the middle of September. However, a resolution in favor of their action during the strike and approving the agreement between the federation and the employers' union was carried by 154 votes to 88, after long and hot discussions.

It must not be lost of sight that in many places in the country, the 8-hour day has been granted to the metal workers without strikes or at least without strikes as important as in Paris. It is difficult to say

what the situation is now from this point of view. The only figures I know are the ones given at the men's convention, which relates to the situation on Aug. 1: Out of 410 federated unions, 232 had reported to the federation that their members work 8 hours a day. Of this number 85 unions had the same wages as before the reduction of the working day, and 147 had higher wages than those prevailing with the 10-hour day.

On the other hand, it is certain that the opposition of the employers to the 8-hour day still exists in certain quarters and that some of them, hoping against hope, expect that some day the French 8-hour day act will be repealed. A. GARNAULT.

Iron and Steel Demand and Output in Japan

Consumption Before, During and After the War—Importation a Continuing Necessity

BY J. P. SUZUKI*

THERE appear to be no definite views, either optimistic or pessimistic, regarding the future of the iron and steel industry in Japan. Those directly connected with the industry do not seem to have schemes in contemplation for increasing their output in order to meet the demand which may spring up in the future. In a word, they are perplexed as to what course they should pursue, whether they should further extend their operations or whether they should remain as they are, turning out their products as they go along and without looking far into the future.

Demand Prior to the European War

The demand for pig iron and steel products in 1913 was altogether 1,105,503 tons; out of which 247,607 tons of pig iron were consumed for castings; 266,991 tons as the necessary material for making steel; 765,672 tons of steel products used for arms, shipbuilding, architecture, railroad construction, etc.; 70,720 tons of steel imported as vessels already constructed; 9,888 tons of steel imported as parts of machinery; and 11,416 tons of steel imported as parts of locomotives, etc.

It will thus be seen that the demand for pig iron for castings in normal times is about 248,000 tons, while some 867,000 tons of steel products are in demand. Supposing, then, that 1.15 tons of pig iron are required for making 1 ton of steel products, about 997,000 tons would be needed in Japan, and if the above-mentioned 248,000 tons are added to this, she would require altogether 1,240,000 tons of pig iron. But before the war Japan could produce only about 242,676 tons of pig iron from ore, and this means that the output was not over one-fifth of the whole demand.

Demand During the War

The demand for iron and steel in 1917 was greater than in any other period during the war. The output of pig iron and iron mixed with other metals in that year was estimated at 501,402 tons. In addition to this output, approximately 977,600 tons of pig iron, steel products and scrap iron were imported. There is no accurate record of steel products which were imported as parts of locomotives, machinery, etc., but it may be safe to state that they were not less than 20,000 tons. Such being the case, the total amount of pig iron and steel products consumed by Japan during that year was something like 1,499,000 tons. It must be remembered, however, that as a pretty large quantity was sent to Korea and exported also to some foreign countries, the real amount consumed in Japan proper being about 1,300,000 tons.

Future Demand

Since the conclusion of the war, the demand for iron and steel in Japan has naturally decreased, and there is not at present the abnormal demand that existed during the war. Although there is no knowing what change will be brought about in future in this direction, yet it is not impossible to secure deductions from some data which we have on hand.

There is every reason to believe that the demand for iron and steel in Japan will yearly increase. This assertion is based upon the result of investigations instituted by the Association for Investigating the Iron and Steel Industry, and it may safely be expected that the demand will increase in the following proportion:

	Tons		
Year	Iron and Steel	Iron for Castings	Steel Products
1920	1,473,900	360,900	1,113,000
1923	1,725,000	430,000	1,295,000
1925	2,403,500	617,500	1,786,000
1928	2,855,000	743,000	2,112,000

The Department of Agriculture and Commerce confidently expects that 1,310,000 tons of pig iron will be produced from ore in 1920 and 1,500,000 tons in 1923. These official figures are based upon the output which the State Steel Works and other private factories expect to turn out, but it may be mentioned that as some of these private steel works will, in all probability, be obliged to go out of business on account of the general depression of trade and for some other causes, it is quite doubtful that 1,310,000 tons will be produced in 1920. The same thing can be said of the output that is expected in 1923. Let us, therefore, take the minimum estimate of the output, say half the amount that is expected. It may not be impossible for Japan to supply half the demand with her own product.

Cost of Production

As far as the cost of production is concerned, there does not seem to be much difference between Japan and other iron producing countries except India and China. It is roughly estimated that about yen 26.85 (about $13.50) is required for producing 1 ton of pig iron in Japan, whereas in India the cost of production is far below this figure, it being estimated at about yen 15 ($7.50) per ton. China cannot possibly produce it so cheaply as India; but it may be quite possible for her to produce at about yen 20 ($10) per ton. Under these circumstances, India can possibly manage to supply at about yen 30 ($15) per ton Japan. Considered from this fact, Japan is helpless to compete with India and China.

Self-Supply a Fallacy

There are some Japanese who try to impress upon the minds of those who are directly connected with the iron and steel industry the importance of self-supply. There can be no question about the importance of building up the industry to a great magnitude with the view of producing enough to meet the domestic demand, but at present the demand far exceeds the supply, so that Japan must necessarily look to other countries for the supply to meet the greater portion of her needs. It is most likely that there will be no change in this condition, owing to the fact that there is not sufficient ore production in Japan to enable her to attain a state of independence of foreign supplies.

*Foreign editor, *Industrial Japan*, Osaka, Japan.

David S. Hays & John L. Denton, exporters of agricultural implements, machinery and hardware, advise THE IRON AGE that they have received the following inquiry from a client in South America: "There is at present a considerable demand here for large installations of every description and we should, therefore, be very glad to receive catalogues of any machinery which you consider might be used in industrial plants including saw mills." This firm, which is located at 24 State Street, New York, also has inquired for paper-making machinery.

Safety Congress at Cleveland

Making Safety a Vital Factor in Steel Plant and Foundry Routine—Why Crane Accidents Persist—Results of Employee Representation

THE eighth annual Safety Congress, held at the Hotel Statler, Cleveland, Oct. 1-4, under the auspices of the National Safety Council, was in many respects the most interesting meeting that has been held under the direction of that organization. The attendance was larger than ever before, being estimated at between 3000 and 4000, and of these about 2000 registered. There was a large representation of women, who took a leading part in two meetings held by the women in industry section. In all, there were 160 regular speakers at the four general, nineteen sectional, round-table and other meetings.

The program indicated a broadening in the scope of the work of the congress as compared with previous annual meetings. More attention than heretofore was devoted to industrial management, one of the largest attended sections, and one in which the delegates showed a great amount of interest, being a general section devoted to employees' represetation. Americanization was given a more prominent place in the deliberations than ever before, one general session being devoted to a discussion of that subject.

Realizing that great progress has been made in safety work in manufacturing plants, and that the loss is the same whether a worker is injured in a factory or on the street, the congress devoted more attention than ever before to the subjects of public safety and safety education; and a new educational section was organized, which will have as one of its objects the introduction of the St. Louis plan of teaching safety in the public schools. A Women in Industry Section was also definitely organized and the congress gave its approval to the organization of an Engineering Section, to be composed of members of various engineering societies or experienced in engineering work.

A feature of the congress was a very complete exhibit of safety and sanitary equipment that was held during the entire week at the Gray's Armory, which attracted a very large number of visitors.

About 800 attended the annual banquet of the congress held at the Hotel Statler, Friday evening. Steven W. Tenor, safety director American Steel & Wire Co., and president northeastern Ohio division, National Safety Council, was chairman, and Alexander C. Brown, president Brown Hoisting Machinery Co., Cleveland, and vice-president northeastern Ohio division, National Safety Council, was toastmaster. Other speakers were James Speyer, treasurer Safety Institute of America, New York, and Ralph C. Richards, the new president.

One entire afternoon during the first general session was taken up with the subject of employees' representation, which was ably discussed from various viewpoints in papers by both production managers and representatives of labor. Albert H. Young, manager of industrial relations International Harvester Co., Chicago, presided, and in his introductory remarks said that employers and employees had found that they could get together around the same table to discuss the non-controversial problems of safety and that led to considering together problems that were more controversial, such as labor matters. Industrial democracy was also hastened by the reports of the Whitley Committee and the activities of the War Labor Board.

Why Employee Representation Succeeds

The first paper was presented by Cyrus McCormick, Jr., works manager International Harvester Co., Chicago, who took for his subject "Co-operation and Industrial Progress." He referred to the unrest that has swept over the world as a result of the war, and declared that the most significant thing in labor conditions to-day is the expressed desire of labor to share in the management of business. He outlined the main reasons that are leading employers to adopt employees' representation and the fundamental principles governing such representation. He described the plan of representation adopted by his company, and referred to the recent labor troubles at the company's plants which forced employees' representation to stand an acid test.

"The workman is asking more than ever before to be regarded not as a commodity, but as a human being," said Mr. McCormick. "He desires self-expression. The laboring man is desiring to share in the management of business, not in the executive capacity, but in matters that affect his being. The relations of employers and employees can no longer be placed on a cash basis. There is the man's soul that demands recognition. I feel that collective bargaining is going to get us out of trouble instead of getting us in trouble, as claimed by some economists. The public is demanding collective bargaining, and is going to get it. We must endow scientific management with soul."

The speaker declared that in adopting any form of employees' representation the simplest plan is the best. There must be no red tape in the election of representatives of the men and no discrimination on the part of the employee. After a man is elected he becomes one of the family and must be accepted as such. Through employees' representatives, if properly handled, the management can feel the pulse of the men, and the men can obtain some understanding of the management. His company made no effort to have the men elect strong representatives, and to keep out radicals, the election being left entirely to the men themselves.

A pamphlet describing the experiences of William Demuth & Co., Richmond Hill, N. Y., in this work, prepared by F. L. Feurbach, factory manager, who was unable to be present, was distributed among the delegates.

Benefits to Plant Operation

A paper on the "Practical Aspects of Employees' Representation" was presented by E. B. Tolsted, Independence Bureau, Philadelphia. The country, he declared, is full of examples of misused power on the part of both employees and organized workmen, and the remedy for existing conditions, he stated, lies along the lines of a clear understanding by each side of its own attitude and the problems of the other. Many employers not hostile to union labor feel that better results will be obtained through employees' representation plans than through the customary union channels, because of the direct relation and the mutuality of interest which can be obtained. Works committees, he pointed out, not only bring complaints to the light before they are too serious to handle, but eventually reduce the number and seriousness of complaints. Foremen have undertaken to reform their ways when their attitude of petty tyranny was the cause of grievances, and have endeavored to adjust complaints satisfactorily when first brought to their attention, rather than allow their negligence to bthe subject of discussion by committees and eventually the object of a reprimand from the management.

The speaker stated that many companies had reported that co-operation is greatly increased as a result of their works committees. In this connection he spoke of the action of the committee of the American Multigraph Co., Cleveland, which urged the company to discharge slackers when the entire production was essential for war purposes, and the adoption by a committee of the Midvale Steel & Ordnance Co. of a resolution recommending that in laying off men superintendents give preference to American citizens and endeavor to rid the works of radicals. One company reported that during the first few months after the establishment of

its works committee system production was increased about 20 per cent and expenses advanced less than 5 per cent, while another company reported an increase of 15 per cent in production, without an advance in wages. Both attributed the increased efficiency largely to better plant spirit brought out by its committees. The White Motor Co., Cleveland, claimed that its works committee was responsible for considerable reduction in turnover and absenteeism. Some companies reported that while at the first election a number of radicals were elected, the employees soon learned to distinguish between mere talkers and competent representativs, and this resulted in the election a second time of conservative persons. When a works committee has been in operation several months it has been found that capacity for leadership among its employees has been revealed. These have been made assistant foremen.

The speaker declared that industrial representation is in successful operation in plants varying widely as to process and products, size and complexity of organization and as to character of the working force. None of these factors seems to determine the success of the plan. At present there are about 150 employee representation plans in operation in the United States. He urged that in adopting such a plan it should be installed under peaceful conditions and should be developed gradually, and should be simple in form. The degree of success or failure depends upon the understanding by both the management and men of what the plan means at its inception. There must be a foundation of confidence between the management and men.

Plea for Organized Labor

Employees' representation from the standpoint of organized labor was presented in a paper by Matthew Woll, vice-president American Federation of Labor, which was read by Fred Schultz, vice-president Cleveland Federation of Labor. This paper was a plea for the cause of organized labor. Without going into the discussion of any other form of employees' representation, Mr. Woll said that industrial problems should be solved through conferences between employers and organized labor. Each group of manufacturers and employees should work out its own problems. The American trade union movement, he said, was founded along practical lines, is democratic in character, and has been tried by years of experience.

The last paper of the session entitled "Labor Management and Collective Bargaining" was presented by W. M. Leiserson, who has the title of impartial chairman of the permanent board of arbitration for the clothing industry of Rochester, N. Y., his salary being paid half by the employers and half by the employees. Mr. Leiserson is chairman of a board that arbitrates disputes between the clothing manufacturers and their various organizations of employees, which, he said, consisted both of union labor and shop organization. The speaker discussed some of the developments of recent years in handling the relations between employers and employees. Referring to the establishment of employment managers who handle labor problems, he said that in many cases when the system was first adopted these managers were mere clerks without actual authority. But they kept at work until they obtained some success. They introduced system and took away the foremen's power to fire employees. Welfare, safety and service work followed. The employment service work has now reached its greatest development; yet to-day there are more labor troubles than ever before. Intelligent employment managers have learned that other machinery is needed to solve the labor problems. Labor insists that there are two sides to the square deal, and the employer and employee do not agree on what the square deal is. The employee wants an equal voice in defining the square deal. The essence of democracy in industry, according to the speaker, is collective bargaining. Democracy means that neither employer nor employee have full control. Many industries have compromised their principle that they must have absolute control. The days of absolute control are passing away.

The speaker stated that there have been various plans of collective bargaining, but contended that many are not the real thing, as the employer holds to the power, but pretends to share it with the employee, and the employee has no confidence in the employer. Some shop or company union plans are really attempts to give collective bargaining. These plans compete with organized labor, and organized labor must compete with shop committees by improving its own methods. The speaker contended that if an agitator can win an employee away from the company's union to the regular union it shows that the company is not granting industrial democracy, and the same statement can be made regarding a labor union in case the company union is winning men away from the regular union. He declared that in the past four year more men have been added to regular unions than have been enrolled in the company shop organizations. Organized labor is growing faster than shop organization, but he welcomed the competition between the two and hoped the best would win. In the clothing industry he said that the plan of having an impartial permanent arbitration board has proved successful, but has not solved everything, although it does prevent strikes and walkouts.

The discussion that followed the papers was almost wholly in the form of rapid-fire questions put to Mr. Leiserson. He had indicated that he favored labor unions rather than employees' representation as a medium for collective bargaining of employers, and most of the questions indicated that the questioners did not agree with his views. In reply to questions, he admitted that leadership and personality probably had much to do with the success of collective bargaining in the garment industry, but referred to the stove molders, who, he said, had been working on a similar arrangement for years. When asked why the coal miners threatened to strike if they have industrial democracy, as had been contended, he replied that the miners were simply carrying out a form of bartering with the mine owners. A threatened strike did not mean a strike. He believed that the best way to introduce democracy in shop management is from the outside, contending that better results are to be obtained from large units or national labor organization than from small units such as shop organizations. One questioner said that there was an impression in most circles that organized labor aims to decrease production and increase wages, and asked if garment workers really wanted to increase production. In reply, Mr. Leiserson referred to a case in which some of the garment makers made demands for wage increases and the employers agreed to make a certain increase if the employees would increase production. The employees made such an agreement, he said, and so far have made good on it.

Mr. McCormick was asked if the employees' representation plan of the International Harvester Co. had resulted in a reduction in labor turnover. In reply he said that it was too early to answer that question, and that while there had been a reduction in labor turnover, it might be due to other conditions; it would take a year to determine definitely.

Metals Section

The first session of the metals section, presided over by J. A. Oartel, director of safety Carnegie Steel Co., was devoted to safety work in foundries. The first paper, presented by H. L. Church, Rockford Malleable Iron Works, Rockford, Ill., was on "Accident Prevention in the Malleable Iron Foundry." He said that there are two safety factors in the malleable iron foundry—the equipment and its upkeep and the human element. The latter is more important, as the amount of equipment is rather limited. Men are leaving the molders' trade and foundrymen are concerned as to where future molders are to come from. Molding must be made more safe to keep the men that are still left in it. The safety problem in the foundry is made more difficult by the fact that molders usually come from the class of men that lack education and is therefore least desirable.

Putting Safety Into the Foundry

In his plant a large percentage of burns were suffered by new men. It was found that the use of goggles, foundry shoes and leggins reduced the number of

burns, but he said that the safety engineer and foundrymen must go further than that, and that the best results can be obtained by getting right at the men. Equipment and sanitation can be controlled, but not untrained men. These must be educated. By following this plan accidents had been reduced in his foundry. Men are told how to do work with a maximum of safety, are required to wear foundry shoes, which must be kept in repair, and the danger of damp ladles is explained to them. A watcher is kept at the furnace to enforce the rules when the heat is being taken off. Men with slight injuries are required to go to the hospital.

The speaker did not think that safety bulletins helped much, but said that pictures did. A plan that is followed in his plant and brings good results is to have a man who speaks several languages go among the men and talk to them individually about safety and accident prevention.

Accident and Welfare Follow-up

Every foundry, no matter how small, should have a first-aid hospital, and if too small to provide a nurse, should train a man to do first-aid work. In order to stabilize the working force and to attempt to bring back men who planned to quit, before they became fixed elsewhere, his company has adopted a policy of making up a list of absentees every morning, and every man who is absent without an explanation is looked up. What the speaker referred to as a by-product of this investigation was the finding of men home suffering from unreported injuries. These men are taken to the foundry hospital every day for treatment until they recover. The speaker held that every malleable foundry should have an employment service department and that safety work could be handled by that department.

In reply to questions, Mr. Church said that in addition to compelling the men to wear foundry shoes, his company intended to require them to wear leggings. A representative of the New Jersey Zinc Co. stated that molders in his company's employ objected to leggings, and in place of these the company had designed heavy duck spats which the men did not object to and which proved entirely satisfactory.

"The Personal Element in a Safety Program for the Foundry" was the subject of a paper prepared by M. F. Gartland, Marion Gray Iron Foundry Co., Marion, Ind. He said that there were three elements with which to contend in the foundry—equipment, product and the man. The safety engineer and the foundry expert have done a great deal to eliminate danger, but the greatest hazard remains, and that is the job for the human engineer. He divided foundry workers who are prone to injury into three classes—misfits, the man with personal troubles, whose mind is ill at ease, and the careless man. If possible, he would place the misfit in some other part of the plant. If a man has personal troubles, so that his mind is not focussed on his work, his problems must be met and solved by a social-service worker or some one else with the proper qualifications. The fortunate thing about the careless man, he said, was that he can be educated both as an individual and en mass.

"Safety in the Steel Foundry" was discussed by Earl W. Kesstler, Detroit Steel Castings Co., Detroit, who outlined the method of handling safety work at his company's foundry. A permanent central safety company is provided, consisting of foremen, and there is also a committee of workmen which makes suggestions along safety lines to the central committee. One of the safety measures he mentioned was the weekly inspection of hooks and chains and their frequent annealing. He declared that a large share of accidents in steel foundries could not be prevented by guards and other safety devices, and that one of the most important functions of the central committee is to train men to be cautious.

The speaker referred to the necessity of making foundries as light as possible, and referred to one foundry in which the walls were whitewashed after an inspector had complained because the interior was too dark. He said there was a question as to how long the coat of whitewash would have a beneficial effect, but it was lasting longer than had been expected.

Dr. L. W. Chaney, United States Department of Labor, in the general discussion, said that foundries were not making as good a showing as other industries in the reduction of the number of accidents, which he said resulted largely in the transport work such as handling heavy castings.

"Consider the Crane"

Various safety matters in connection with steel plant operations were discussed during two sessions of the metals section. "Consider the Crane" was the subject of a paper by Chester Rausch, assistant director Safety Institute of America, 18 West Twenty-fourth Street, New York. Among the main sources of hazard in operating locomotive cranes he mentioned the failure to keep the crane trackway in good condition, danger of collision with buildings when trackways are placed too near them, overturning and inability of the operator to maintain a clear view behind and ahead when traveling. He said that too many overhead cranes are used without adequate signs to indicate their safe load capacity, and many are operated over inadequately illuminated spaces. He recommended that there should be a free aisleway from one length of the craneway to another, over which the loads may be carried without the necessity of passing over more than a few individuals. There may not be many old shops with which this is possible, but there should be some portion of the shop kept as free as possible from men and valuable material and machines to permit the crane operator to carry material over such space with minimum hazard.

Many cranes do not have the electrical equipment in the cab properly guarded. He contended that it is almost criminal to fail to provide an adequate repair deck over which a crane may be housed for oiling and repairs. The speaker said that in cranes equipped with lifting magnets the weak point in their safe operation is the cable connecting them to the source of power or the power supply itself. This cable is subject to rough handling, as a result of following the movements of the magnet and from its contact with the ground. One of the best solutions of this difficulty has been the adoption of a cable which can follow the magnet in the same manner that the lifting cable follows it. If this cable passes over a groove pulley at the tip of the boon, or on the trolley drum of the traveling crane, and is so arranged that a counterweight will carry the slack down to the boon, or so that it will wind up on the drum of the trolley, most of the wear will be eliminated.

Creating a Vital Interest in Safety

A paper on "New Ways to Put Safety Across in the Steel Plant" by H. P. Heyne, safety inspector United Alloy Steel Corporation, Canton, Ohio, led to an interesting discussion. Claude Smith of the Inland Steel Co. referred to some new methods adopted by his company to arouse interest among the men in safety matters. A record is kept of gangs of men who have very few accidents and group photographs are taken of these gangs and each man is given one of the photographs, which is also published in the company's safety bulletin. This was found to work out very successfully in getting the co-operation of the men. Another measure that has proved satisfactory is the drawing of safety cartoons on blackboards about four times as large as the bulletin boards, near which they are placed. Pictures on these blackboards are changed twice a week.

Another method adopted to arouse interest in safety was the giving of raffle tickets to men who avoid accidents. This brought out an objection that prizes should not be given for safety work, but that men should be impressed that they have certain responsibilities that are a part of the job. Mr. Smith replied that the usual safety educational work was conducted in the plant, and prizes were an added feature. Safety could be put across without prizes, but prizes made it easier. In his plant when prizes were offered for suggestions there were four times as many suggestions as when there were no prizes. It was suggested that the question, as to whether better results can be obtained in safety work by offering prizes or not, be selected as one to be considered at the next meeting.

A practical demonstration of investigating accidents

was presented by H. J. Weeks, chief safety inspector of the American Steel & Wire Co., with a number of employees of that company. A court of inquiry was staged and witnesses were examined to ascertain the cause of a certain accident and means for preventing similar accidents.

"Humanizing the Steel Plant" was the subject of a paper by Phillip Stremmel, hot mills superintendent National Enameling & Stamping Co., Granite City, Ill. He said that if the steel industry is to be humanized confidence must be restored between the employer and employee and there must be co-operation between the employer and employee. The industry must be humanized to save itself from industrial revolution and also that we may play our part in world reconstruction.

Raymond G. Adair, safety engineer American Rolling Mill Co., Middletown, Ohio, in a discussion of Mr. Stremmel's paper, told the methods adopted in his company's plant to develop the human relationship. He said that they try to show the men that they are not objects of charity and they consider that members of the organization belong to one big family. To develop this close relationship his company has fostered amusements for the workmen, established a grocery store and a bank, provided life insurance and allotted garden spaces.

Election of Officers

Officers elected for the ensuing year were as follows: President, Ralph C. Richards, chairman central safety committee Chicago Northwestern Railway, succeeding D. Van Schaack; general manager, C. W. Price, re-elected; secretary and chief engineer, Sidney J. Williams, re-elected; treasurer, Miss Kathryn Hunt. J. A. Oartel, director of safety Carnegie Steel Co., was re-elected chairman of the metals section; W. E. Watters, National Malleable Castings Co., Melrose Park, Ill., was elected vice-chairman, and H. Edward Steinmetz, Midvale Steel & Ordnance Co., succeeded Mr. Watters as secretary.

Among the newly elected directors are the following: L. B. Burnett, assistant to the president, Carnegie Steel Co., Pittsburgh, Pa.; W. H. Cameron, manager industrial relations, Eastman Kodak Co., Rochester, N. Y.; C. L. Close, manager Bureau of Safety, Sanitation and Welfare, United States Steel Corporation, New York; Robert F. Coleman, director of personnel, Pierce Arrow Motor Car Co., Buffalo; Dr. Otto P. Geier, manager employees' service department, Cincinnati Milling Machine Co., Cincinnati; Arthur T. Morey, general manager Commonwealth Steel Co., Granite City, Ill.; Philip Stremmel, National Enameling & Stamping Co., Granite City, Ill.; Stephen W. Tener, manager accident and pension department, American Steel & Wire Co., Cleveland, and J. M. Woltz, safety director, Youngstown Sheet & Tube Co., Youngstown, Ohio.

National Steel Fabricators' Association

The National Steel Fabricators' Association, organized during the war and composed of 88 fabricating concerns throughout the country, held a meeting in the William Penn Hotel, Pittsburgh, last week. This organization was formed as a war measure, and offered its services to the Government during the war in any capacity in which it could be of help. The meeting was called to consider the question of continuing the organization. After a full discussion, it was decided that the organization should be continued, and the next action taken was to declare for the "open shop" in all the industries at present affiliated. It is proposed to take in later the concerns building oil and gas tanks.

An executive committee of nine was appointed, consisting of George P. Bard, Petroleum Iron Works Co., Sharon, Pa.; C. J. McIntosh, Federal Bridge & Construction Co., Waukesha, Wis.; Thomas Earle, Bethlehem Steel Bridge Corporation, Bethlehem, Pa.; G. A. Treter, Virginia Bridge & Iron Co., Roanoke, Va.; H. A. Fitch, Kansas City Structural Steel Co., Kansas City, Mo.; Paul Willis, Kenwood Bridge Co., Chicago; C. G. Conley, Mt. Vernon Bridge Co., Mt. Vernon, Ohio; Clyde MacCormack, Phoenix Bridge Co., Phoenixville, Pa.; and C. M. Denise, McClintic-Marshall Co., Pittsburgh. This committee was empowered to elect the officers, which will be done later. Thomas Earle was made chairman of the executive committee, and Lewis D. Rights of the Shoemaker-Sattelthwait Co., Pottstown, Pa., was elected secretary-treasurer. It is proposed to hold one meeting a year of this organization, but no date was selected for the next meeting.

Massachusetts Technology's New Industrial Consulting Program

The Massachusetts Institute of Technology, Cambridge, Mass., has adopted a plan whereby it sells the services of its staff and laboratories to industrial concerns for solving technical and industrial problems beyond the scope of the private engineer and laboratory. Payment will be in the form of an annual retaining fee. Industrial organizations contracting with the institute will under proper conditions have the opportunity of utilizing its great plant, of conferring with its technical staff and of availing themselves of its great libraries and valuable technical files. Information will be available in the record of the qualifications, experience and special knowledge of its 13,000 and more alumni, from which source industrial organizations will be able to obtain information, where special knowledge and information is available and where men can be obtained for special problems or permanent employment. In thesis work investigations by undergraduates preference would be given problems which confronted the corporations.

Contracts for this service have already been sold to the American International Corporation, the General Electric Co., the Utah Copper Co., the Chile Copper Co. and other firms, totalling thirty-two up to Nov. 26.

The American International has contracted for $50,000, $10,000 a year for five years. The General Electric Co., with which the institute has carried on a co-operative course for several years, has signed a similar contract for $50,000.

William C. Potter, partner of Guggenheim Brothers, is chairman of the industrial committee which is putting this project before the industries of the country.

Foundries Full of Work

In writing of the pig iron market and of the pressure from foundries for metal due on their contracts, Rogers, Brown & Co. say in their Cincinnati letter:

"It was thought by some that possibly the steel strike would ease up the foundry situation somewhat, that furnaces which had been producing steel-making grades would turn over to foundry, and that spot iron would be easier. The theory possibly is correct, but although a few of the furnaces have resumed operations recently, spot iron is harder to find than ever. The foundries are simply rushed to death, many of them working night shifts, and they are finding it practical and profitable to eke out their present supply of the standard grades by picking up lots of iron somewhat above the customary sulphur limit."

The Matthew Addy Co.'s market letter has the following: "There is not enough coal to make all the coke that is needed for the blast furnaces. And this strikes at the very fountain head of the trade, for the whole structure depends on pig iron. Unless the furnaces perform, the foundries and steel mills quit. The collateral effects of a shortage of coal are enormous; it means the paralysis of industry. So this week the market is in a frantic, feverish condition. Consumers are anxious to secure iron, feeling that unless they get iron now presently there will be no iron to be gotten for either love or money. Iron masters are doing their utmost to get coke so as to keep their furnaces in operation. The supply of spot iron is extremely limited. Everything the furnaces can make is being shipped out hot. At the present writing there is nothing to indicate that a change to easier conditions is in sight. In fact, it looks as if the winter in the iron trade will be strenuous and that there will be a struggle right along on the part of producers and consumers alike to get enough of their own raw materials to keep going."

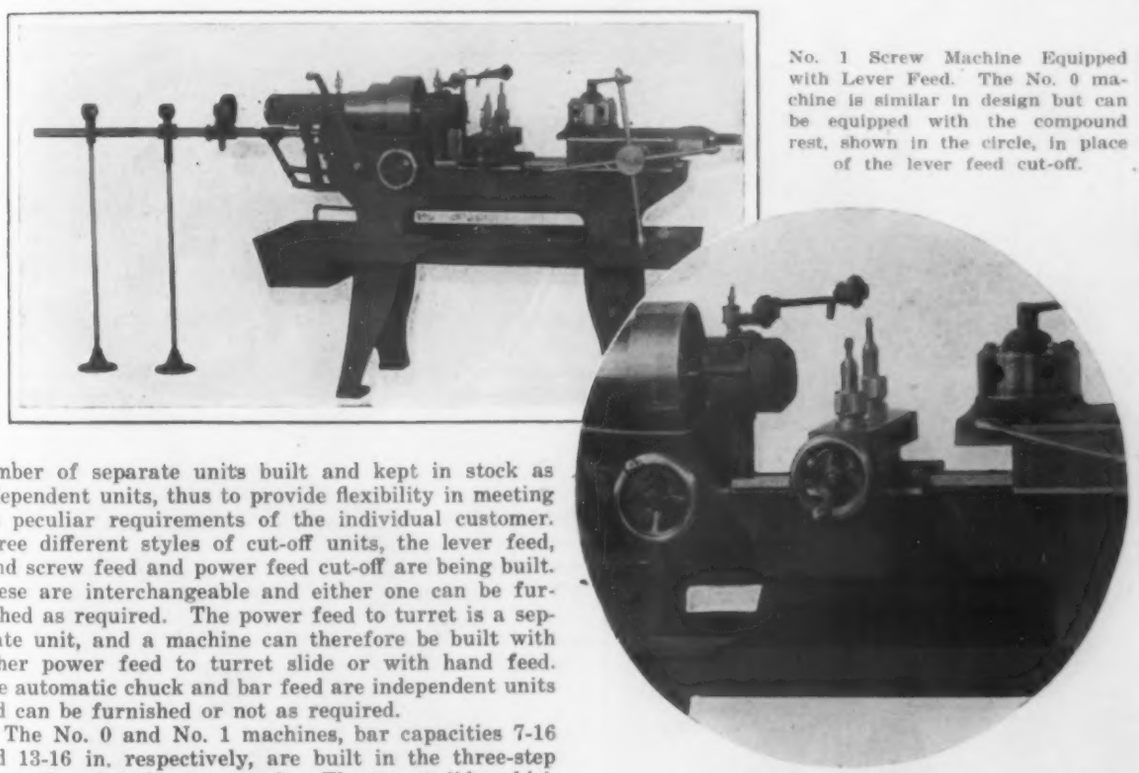
Screw Machines of Interchangeable Design

Assembled from Independent Units—Lever, Hand Screw or Power Feed Cut-off —Bar Capacities of 7-16 to 1 13-16 In.

THE Foster Machine Co., Elkhart, Ind., announces a line of screw machines embracing five sizes, to be known as the Nos. 0, 1, 3, 5 and 7, with corresponding bar capacities of 7-16, 13-16, 1 5-16, 1 13-16 and 2 9-16 in. respectively. Several new features, it is stated, have been incorporated. It is explained that these machines do not represent any radical departure from established practice but are built upon fundamental principles of correct machine design and have incorporated in them desirable features found in other makes of screw machines.

The power and rigidity provided is stated to be in excess of the requirements made necessary by the latest developments of high speed steel and stellite, thus to provide for additional improvements that may be made in cutting steels.

The unit principle of design has been carried out, in that each individual machine is assembled from a number of separate units built and kept in stock as independent units, thus to provide flexibility in meeting the peculiar requirements of the individual customer. Three different styles of cut-off units, the lever feed, hand screw feed and power feed cut-off are being built. These are interchangeable and either one can be furnished as required. The power feed to turret is a separate unit, and a machine can therefore be built with either power feed to turret slide or with hand feed. The automatic chuck and bar feed are independent units and can be furnished or not as required.



No. 1 Screw Machine Equipped with Lever Feed. The No. 0 machine is similar in design but can be equipped with the compound rest, shown in the circle, in place of the lever feed cut-off.

The No. 0 and No. 1 machines, bar capacities 7-16 and 13-16 in. respectively, are built in the three-step cone pulley plain head type only. The turret slide, which is operated by a hand lever, has an effective longitudinal movement of 3 in. for the No. 0 and 5 in. for the No. 1 screw machine. The No. 0 machine can be equipped with a compound rest, which is interchangeable with the lever feed cut-off ordinarily furnished with this machine.

The No. 3 machine, bar capacity 1 5-16 in., is built in both the plain head and friction head types. The No. 5 and No. 7 machines, bar capacity 1 13-16 and 2 7-16 in. respectively, are built in the friction head type only. The turret slide has an efficient travel of 7 in. for the No. 3, 9 in. for the No. 5 and 11 in. for the No. 7 machine.

One of the accompanying illustrations shows the gear friction head for the No. 5 screw machine. The friction clutch is mounted on the spindle between the cone pulley and the friction gear and engages the spindle with the cone pulley on one side or with the back gears through the large diameter spindle gear on the other. The frictions are of the cone type and are operated by a hand lever through the medium of a long movable sleeve and four fingers mounted on the spindle.

The head is cast integral with the bed, which is of the rigid double girder type, ribbed internally.

The automatic chuck is of a standard spring collet type. The automatic chuck hood and spindle nose have been designed so as to gain as short overhang as possible from the front spindle bearing. The collet operating mechanism is explained as differing from the usual design in that it utilizes the fork lever principle instead of the well known sliding fork principle. This, it is stated, eliminates the cocking action and reduces the friction. The automatic chuck fingers are equipped with rollers to reduce friction at this point.

The bar feed operating mechanism is explained as new in design. For the Nos. 0, 1 and 3 machines, the single supporting rod is used, but for the No. 5 and No. 7 machines the stock support slides on two parallel bars. The continued motion of the automatic chuck lever, as it opens the collet, feeds the bar forward. This is accomplished through a system of links and levers in such a manner that the automatic chuck and the bar feed are operated intermittently.

The No. 0 and No. 1 machines are equipped with the round turret, while the Nos. 3, 5 and 7 machines, because flanged tools are desirable for the heavier work done on these machines, have the hexagon turret.

The turret indexing mechanism is emphasized as sensitive in operation. The vertical lock bolt is mounted underneath the front side of the turret. The end of the lock bolt lever, which intermittently engages the tumbler for withdrawing the lock bolt preliminary to the indexing of the turret, is equipped with a roller for the sake of sensitiveness and reduction of wear. The rearward travel of the slide indexes the turret by means of indexing pins in the bottom of the turret and a pawl pivoted in the saddle.

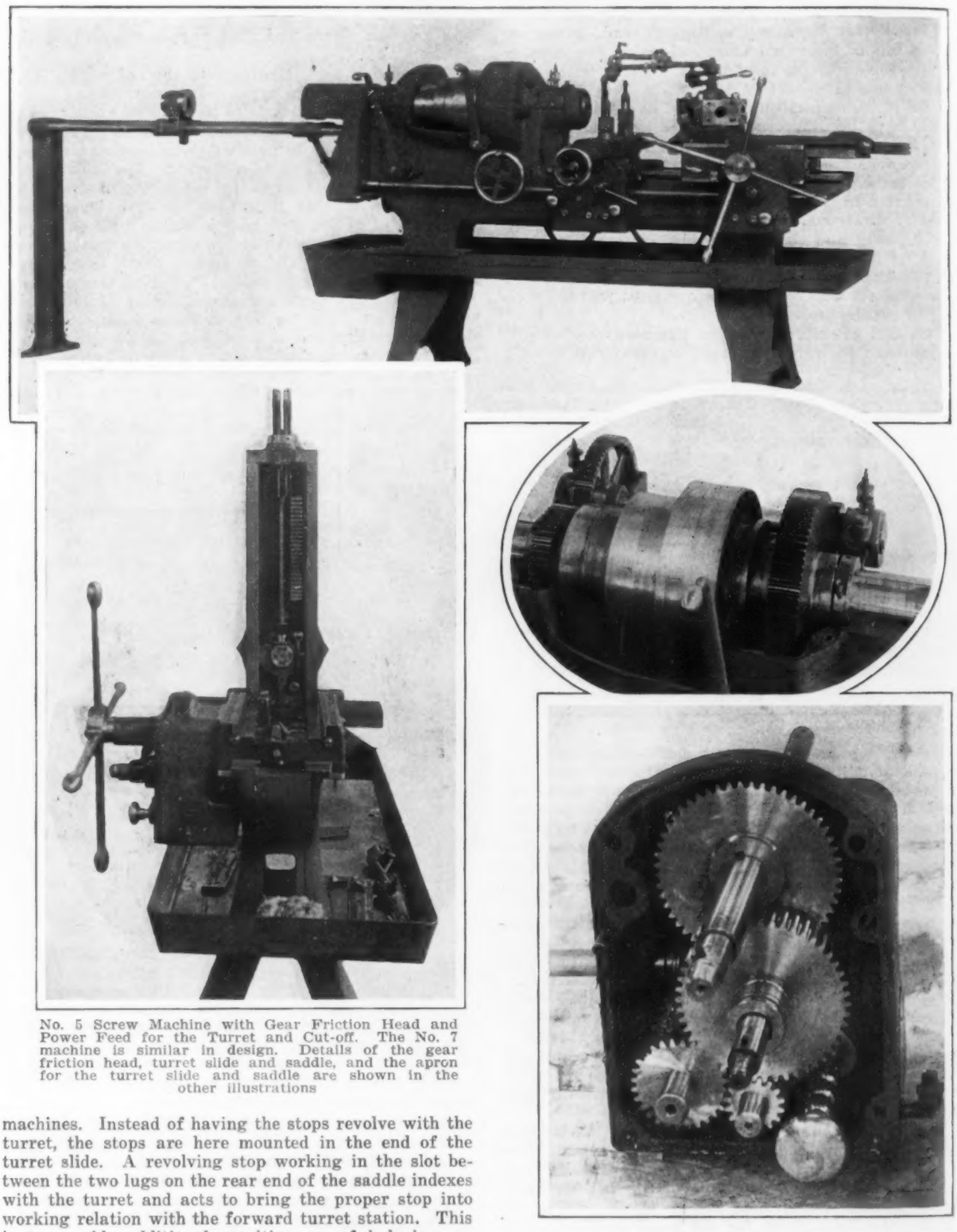
The Nos. 3, 5 and 7 machines are equipped with a

system of revolving independent stops which are geared to the turret, with which they index. The stop screw working in conjunction with the working station of the turret abuts a movable stop in the saddle. This movable stop stands in working relation with the mechanism disengaging the automatic feed in the saddle apron.

The system of independent stops for the No. 0 and No. 1 screw machines differ from the one on the larger machines. Instead of having the stops revolve with the turret, the stops are here mounted in the end of the turret slide. A revolving stop working in the slot between the two lugs on the rear end of the saddle indexes with the turret and acts to bring the proper stop into working relation with the forward turret station. This is to provide additional sensitiveness of indexing, as the stop screws do not have to revolve with the turret. This is emphasized as an important point on a small machine working on delicate work, producing many parts per hour, each one possibly requiring the turret to be indexed several times. The design of the turret indexing mechanism is the same as on the larger machines.

One of the illustrations shows the power feed rack which is secured to the under side of the turret slide. This rack engages a pinion, mounted on the long through shaft which is shown in the interior view of the power feed apron. The motion is transmitted through the power feed rod to the worm and worm gear in the apron. Three sliding gears provide for the feed changes. These three changes are multiplied by a cluster of two sliding gears in the gear box at the end of the machine. This provides six changes in all. The lower gears in the gear train, including the work gear, run in a bath of oil.

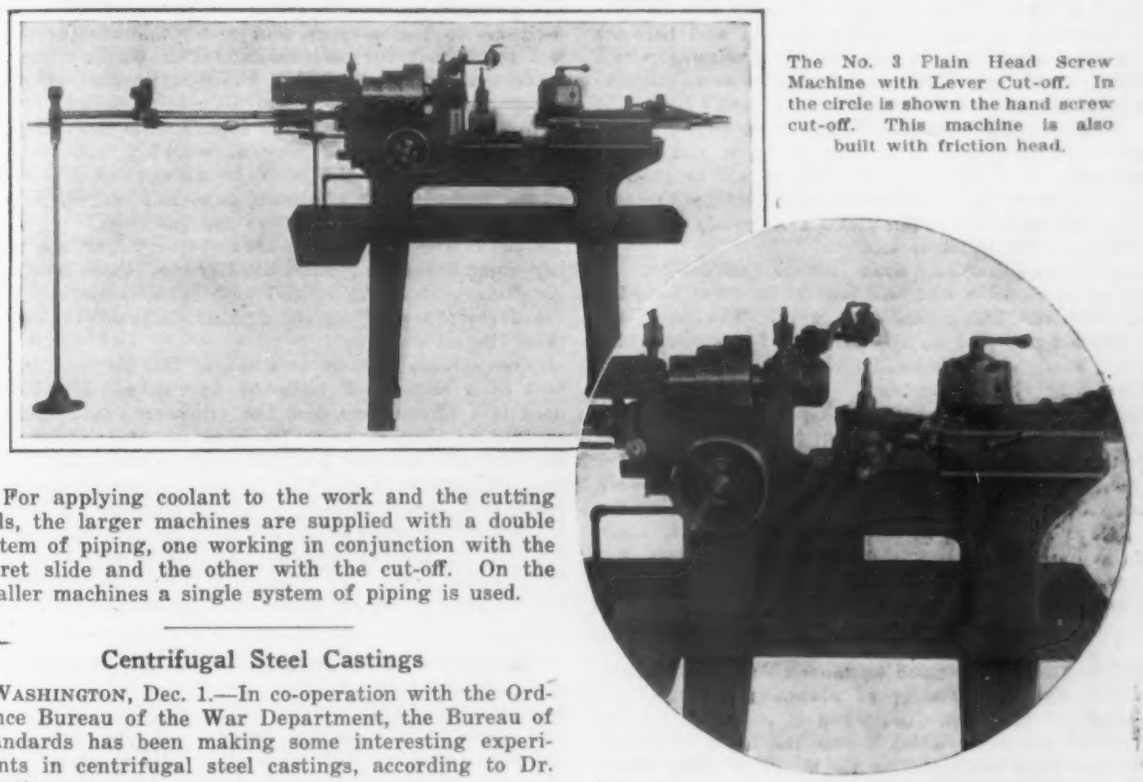
The cross feed apron is similar in design to the saddle apron with the difference that additional sliding gears are introduced in the train to obtain the reverse of the feed movement. The feed friction which works in conjunction with the two large intermediate gears



No. 5 Screw Machine with Gear Friction Head and Power Feed for the Turret and Cut-off. The No. 7 machine is similar in design. Details of the gear friction head, turret slide and saddle, and the apron for the turret slide and saddle are shown in the other illustrations

is operated by a rapid acting cam manipulated by a hand lever. The three-step sliding gear nests in the apron, in conjunction with the two changes obtainable in the gear box at the head end of the machine, as already described, provide six changes of feed to the cross slide.

A feature emphasized is the location of the hand longitudinal feed screw for the various cut-off units between the ways of the bed, so that the force moving the cut-off carriage on the bed is thus applied in the middle of the guide instead of on the front side where it might introduce a cocking action resulting in inaccuracy of the adjustment and undue wear of the machine at this point. Immediately inside of the hand wheel for the hand longitudinal feed is mounted a graduated dial equipped with observation stops. This facilitates adjusting the cut-off carriage longitudinally. A similar graduated dial with observation stops is also mounted on the cross feed screw for use with the movement of the cross slide.



The No. 3 Plain Head Screw Machine with Lever Cut-off. In the circle is shown the hand screw cut-off. This machine is also built with friction head.

For applying coolant to the work and the cutting tools, the larger machines are supplied with a double system of piping, one working in conjunction with the turret slide and the other with the cut-off. On the smaller machines a single system of piping is used.

Centrifugal Steel Castings

WASHINGTON, Dec. 1.—In co-operation with the Ordnance Bureau of the War Department, the Bureau of Standards has been making some interesting experiments in centrifugal steel castings, according to Dr. Stratton:

This method produces an ingot of hollow cylindrical form and it was thought that there would be a considerable saving of material, labor and time in the manufacture of cylindrical steel appliances. If the method warranted, it was hoped to be able to substitute cast or heat-treated cast material made by this centrifugal process for forged pieces. The castings submitted for examination were a miscellaneous assortment of four of several chemical compositions and cast under various conditions, but none of the cylinders being cast strictly in accordance with specification requirements for ordnance material. Very interesting and promising results were obtained.

Segregation of the elements—carbon, sulphur and phosphorus—appears to exist only radially and is confined mainly to a very thin layer of the inner zone, but exists also slightly in the outer zone. Nickel also appears to segregate somewhat, following the carbon. The maximum carbon segregation found amounted to 0.09 per cent in a steel containing 0.66 per cent carbon and nickel 2.2 per cent. Blowholes appear only in the inner segregative zone. The density across a section is practically constant; tensile and shock tests show in general greater strength and elasticity, but less ductility in tangential than in longitudinal directions. This method of casting develops very slight internal stresses. By suitable heat treatment the physical properties of steel cast by this method compare very favorably with forged material of the same composition. The metal of the casting is clean and sound and its microstructure better than in ordinary types of steel casting.

Medal Given to Eugene Schneider

Dr. Eugene Schneider, head of the Creusot Works of France, was presented with the gold medal of the Mining and Metallurgical Society of America at a brilliant dinner of a testimonial character to him at the Biltmore Hotel, New York, Nov. 24. The award had been announced to him about a year ago by E. Gybbon Spilsbury in Paris on the occasion of a visit of a delegation of American engineers to France, but the actual bestowal remained for Dr. Schneider's coming to the United States.

Speeches were made by Bradley Stoughton, secretary American Institute of Mining and Metallurgical Engineers; Dr. Henry M. Howe, the distinguished metallurgical engineer; Dr. Charles M. Schwab, chairman Bethlehem Steel Corporation, and Col. Manus McCloskey, U. S. A. Mr. Schwab in his usual happy way told how he had visited the Creusot works 31 years ago in the company of Gen. William Crozier, U. S. A., when he first met Mr. Schneider and incidentally found that the works were thrown wide open to them. Though he owned to being proud of Bethlehem, he referred to Mr. Schneider and the Schneider works as the teacher and leader in the production of ordnance. Mr. Schneider in his reply devoted himself particularly to his desire of developing close co-operation between Europe and the American nation. While he was particularly interested in helping Europe through its present difficult period of financial settlements, the co-operation he had in mind was not to be limited to this period or to financial matters but he urged that there should be a continued mixing of minds and mentalities in the common work and mutual relations of the future. President H. H. Knox of the society was toastmaster.

A drafting machine of the type with a square controlled by two sets of parallels is being manufactured by W. Mavitta, at the Anchor Works, Park Road, Aston, near Birmingham, England. The machine is designed to overcome backlash, thus to make for accuracy at all positions on the board.

German Machine Tool Industries in 1919*

Prospects as to Labor and Materials—Imitations of American Tools—Prices Now and in 1914—Leading Manufacturers and Dealers

BY ALEXANDER LUCHARS†

THE outlook for the coming winter in Germany is most uncertain, and conditions as they exist in the spring will have much to do with her stability and future progress.

Coal Shortage and Taxes

The German coal which must be given up to France, leaves about 40 per cent of what was used last winter, when there was much suffering among the poor for lack of fuel. This shortage probably will be further increased by the prevailing strikes and through loafing and slacking. In one Westphalia mine which formerly employed 6100 workers, and now employs 6700, the output is only about 50 per cent of what it was in 1914. The coal shortage will of course affect factories, so that many may close down or run on reduced time. It is expected that wages will be paid in such cases, part by the Government, part by the employers, adding to the taxes which are already crushing all who have anything to tax.

These taxes often work severe hardships. A maker of small tools who had been in business for fifty years sold out for a million marks. The new law took 800,000 m., and as the income of the remainder was not enough to live on, he went to work again at the bench in his former shop. Besides the taxes on income and profits, those on principal or business capital range from 15 to 65 per cent; but the payment of the latter may be made in 30 annual installments at 6 per cent. Many people, especially among the business classes, are very despondent, and even faithful workmen (there are many) seem to have lost heart in their work, saying that there is no incentive to labor, for they can save nothing, and the product of their toil goes only for taxes and indemnities.

Labor Conditions

Employers are harassed by labor's demands and restrictions, by the difficulty of obtaining material, of disposing of their product when it is ready, by the depreciated currency which forms the basis of trade, by the enormous taxes and all the minor troubles which follow in the train of these greater ones. But the future is not all gloomy. There are some who say that if the workmen will only *work* for whatever wages can be agreed upon, the other evils can be taken care of in time. Some believe labor is beginning to see that the demoralization in fundamental conditions affects working people more than any other class, and that some reasonable working basis must be reached on which the employer and employed can stand.

The strike at the great Siemens' works, employing 32,000 hands, is typical of German industrial conditions. This strike was caused by the tearing down of a notice posted by the management that on July 21, the international "strike day," all the Siemens' plants would be open to those who cared to work. In every works there is a shop committee which, with the management, passes on certain questions that concern the employees (too intricate an arrangement to explain here), and all notices relating to such questions are to be signed by both the management and the shop committee. The notice in the Siemens' works was not signed by the committee, the management claiming that it was not included in the provisions referred to. When the notice was torn down the forty-one members of the shop committee were discharged, whereupon 10,000 workmen began "passive resistance" (loafing around the shop during the working hours and doing no work). These men were told that they must work or be discharged, and, refusing, they were discharged. Then the remaining 22,000 workers struck. Finally, I am told, when the shop committee acknowledged they had exceeded their rights in tearing down the notice, they were taken back and the remaining 32,000 came back.

A law has been introduced in the National Assembly giving a representation in the management of each business to the workers, but many manufacturers do not think that such a representation would mean interference. Partial strikes in departments of vital importance to the works are a favorite resort; for in such cases the workers in the departments not on strike come to the shop and play at working, but produce almost nothing for lack of material, causing great loss to the management who must pay their wages. In the case of total strikes no wages are paid.

Clerks and sales people here are all organized, having committees and rules similar to shop workers. Employers who have to deal with both classes say that the former are, if anything, more difficult to handle than the latter.

One serious obstacle to stability and progress is the lack of a recognized national executive. The President is a figure-head, and the ministers, with the exception of Noske, have no real power. Noske, the Minister of National Defense, derives his power from the willingness of the soldiers to execute his orders; but except for its officers, the army is made up mostly of men who remain in it, not from motives of patriotism, but for the pay and food, and when a better place offers many leave. Its reliability is said to be increasing, and is the saving factor in a precarious situation.

Wages

Prices of all kinds of labor, of metals and materials, and especially of machine tools, have naturally increased much more in proportion than in America—and prices have increased here since the armistice, although the supply of labor should be greater.

A general comparison of wages paid to machinists and machine shop workers in 1914 and 1919 is given below:

	Wages Per Hr.			
	1914		1919	
Lathe Hand	M. 0.60 to	M. 0.75	M. 3.25 to	M. 4.00
Milling Machine Hand	0.56 to	0.60	2.55 to	3.50
Planer Hand	0.60 to	0.72	2.90 to	3.75
Assembler and Fitter	0.56 to	0.70	2.70 to	3.60
Drilling Hand	0.48 to	0.56	3.00 to	3.50
Blacksmith	0.95 to	1.15	3.50 to	4.00

On piece-work the man must be guaranteed a minimum wage of about 25 per cent more than for day work. There are no large wages earned at piecework, for the men will not produce more than an average amount of work under any conditions.

The above figures, however, do not afford an accurate comparison of labor costs on account of time lost loafing, talking and "slacking." In the machinery industry the average hourly product under the 8-hr. day is about 50 per cent of what it was in 1913-14. In the Ludwig Loewe works I was told that their product per man per hour for the first six months of 1919 was 52 per cent of what it was in 1913-14. In some works it is much less.

Besides the increased wages and diminished output, manufacturers must reckon with extra bonuses or contributions in cash, up to 800 m. for each person or member of the organization such as foremen, draftsmen and superintendents, to enable them to pay their debts. The upper class employees have been giving more trouble lately than the workers.

*From data gathered as trade commissioner for the U. S. Department of Commerce, and written in Berlin about Aug. 1.

†President Industrial Press, New York.

All over Germany the 8-hr. day prevails, but the division of the day varies in different localities. In most Berlin machine shops the workers start at 7 a. m., work till 12.10 p. m., take 20 min. for lunch, and quit at 3 p. m. On Saturday the quitting hour is 1 p. m., making 44½ hr. a week. In the Spandau arsenal when the armistice was signed there were about 40,000 workers employed. The Government dared not throw them out of work, so they continued to come during hours, but produced nothing, because whatever they produced would have represented only spoiled material. After some months of this it became evident that 25,000,000 m. a month could be used to better advantage in other ways, so the force was cut down to skeleton dimensions.

Prices

The following figures give an idea of the increases in the prices of materials from 1914 to 1919. The heavy increase in prices are due not to profiteering, but to greatly increased manufacturing, transportation and other costs. Foundry pig iron, which was quoted at 74.50 m. in the second quarter of 1914, was quoted at 215 m. in the first quarter of 1919, and 356.50 m. in the second quarter of this year. Prices have now been lowered by 52 m. to 90 m. per ton, but the Pig Iron Union states that the blast furnaces are working at a heavy loss.

The materials used in making pig iron have, of course, increased accordingly, coal briquettes having advanced from 13.75 m. to 66.10 m. and blast furnace coke from 17.00 m. to 88.85 m. per ton.

The advances of prices for raw and half-finished products are given in the following table. The prices given are marks per ton.

Date	Ingots	Billets	Sheet Billets	Sections
May, 1914	82.50	95.00	97.50	110.00
Jan. 1, 1919	285.00	300.00	305.00	320.00
March 1, 1919	385.00	400.00	405.00	420.00
May 1, 1919	405.00	475.00	480.00	520.00

Copper is now selling at 5.25 m. a kilogram (official price). High-speed steel sells for 27.50 m. per kg.

There is no room in this article for an extended comparison of prices; but a few typical examples may be of interest:—A freight locomotive, which cost, before the war, about 80,000 m. and in 1918 about 225,000 m. cannot be bought now for less than 400,000 m. Gasoline costs about 18 m. per gal.; automobile tires, 32 x 4½, 1400 m.; bicycles, 1500 m. A Ford automobile, three years old, without tires, sold recently for 10,000 m. Second-hand American typewriters sell for 1200 m.; typewriters of German make, 1200 m. These are of course transient prices; when supplies come in they will fall sharply.

Machine-Tool Output During the War

The following table, compiled by Prof. Schlesinger, an authority on the subject, gives the output of German machine tools during the past six years, and a comparison of prices as well:

German Machine Tool Production—1913-1918

Year	Production in Million Marks	Selling Price, Mark per Kg.	Production in Tons
1913	1060	1.00	1,060,000
1914	1045	1.10	950,000
1915	695	1.30	530,000
1916	660	2.00	330,000
1917	1720	2.50	680,000
1918	780	3.00	260,000

Many and varying estimates have been made of the value of machine tools now in stock in Germany, but conservative authorities place the amount at between 200,000,000 m. and 300,000,000 m., which is a normal figure. This does not include tools owned by the Government, but those are not expected to come on the market. The tools in private stocks are said to be second or third-rate products; and this statement is supported by the fact that nearly all first-class German machine-tool makers are behind in their deliveries—some claim from six to nine months.

Depreciation of the Mark

All German prices must be considered in relation to the impaired value of the mark, which is now quoted at about 17 to a dollar, as compared with 4¼ in 1914, and similar, although not so great, differences are noticeable in comparison with all Allied and neutral money values. Its effect on imports into Germany is evident, and establishes prohibitive prices for American machine tools here. The price of German machine tools advanced three times by the Government during the war—43½ per cent in 1917, and in 1918, 66 per cent over the 1917 prices. No further Government advance was made, but manufacturers advanced prices from 20 per cent to 40 per cent at the end of 1918; and many prices have further advanced (except on war material tools) during 1919. Special machines for peace-work use advanced up to 200 per cent, and some small machine tools as much at 500 per cent over 1914 prices. But German tools of the best makes still sell for considerably less than similar American tools can be sold for according to the following figures furnished me by two well-known German dealers:

Prices for Best Makes of German Machine Tools—1919

Gap Lathes, 12 in., 3½ ft. centers	3400 m.
Gap Lathes, 16 in., 3½ ft. centers	4800 m.
Gap Lathes, 16 in., 5 ft centers	5100 m.
Gap Lathes, 18 in., 3½ ft. centers	4500 m.
Gap Lathes, 20 in., 5 ft. centers	7400 m.
Gap Lathes, 20 in., 7 ft. centers	7750 m.
Gap Lathes, 26 in., 7 ft. centers	10300 m.
Engine Lathes, with gap, lead-screw and feed-rod, 16 in., 5 ft. centers	7000 m.
Engine Lathes, with gap, lead-screw and feed-rod, 18 in., 3½ ft. centers	8000 m.
Engine Lathes, with gap, lead-screw and feed-rod, 18 in., 5 ft. centers	8500 m.
Plain Milling Machines (according to size) from	4000 m. to 9000 m.
Universal Milling Machines (according to size) from	7500 m. to 8500 m.
Vertical Milling Machines	7200 m.
Crank shapers, 14 in.	4200 m.
Crank shapers, 18 in.	5000 m.
Crank shapers, 22 in.	7000 m.
Drilling Machines, 20 in.	1300 m.
Drilling Machines, 22 in., power feed	2700 m.
Four-spindle Automatics, 1¾- and 2¼-in., 26,000 to 27,500 m.	

My personal opinion is that the above prices are lower than those for which first-class machines can be bought.

Comparison of Prices of German Machine Tools—1914-1919

	1914 M.	1919 M.
High-speed Engine Lathe, geared head, 18 in., 3½ ft. centers	2800	9000
Tool-room Lathe, 14 in., 3½ ft. centers	2400	8600
Milling Machines, Hand	230-280	950
Plain (three different sizes)	800	2700
	2600	8100
	4400	13000 to 14000
Universal, including head	3500	10000 to 12000
Radial Drilling Machines, 3½-ft.	2400	8000 to 10000
Radial Drilling Machines, 5-ft.	4800	16000 to 18000

All the prices stated are subject to change from day to day, and many manufacturers refuse to quote prices until the tools are ready for delivery.

No American machine tools have come into Germany, except through Holland and Sweden, for about three years, and no reliable comparisons can be made between the selling prices of our tools here in 1914 and the prices that would have to be put on them now. The high ocean freight rates, which will undoubtedly fall in the near future, and the low value of the mark, make any comparisons of little value; but judging by what former agents of American manufacturers say, the figures would range from four to seven times what they were in 1913-14, and from 50 per cent to 75 per cent more than similar German tools sell for. One dealer estimated that an American 14-in. lathe, which he sold for 2000 m. in 1914, he would now have to sell for 11,000 m. to 12,000 m.; while a German tool of the same size and of a good make would sell for 6000 m. to 7000 m. A Gleason bevel gear planer, sold here in 1914 for about 9000 m., would now have to be sold for 60,000 m. A Baker Brothers type keysteater, 13-in. stroke, weight 2250 lb., made by A. H. Schutte, is offered at 5500 m. A Four-spindle automatic, by the same maker, is sold for 27,500 m.; 10-in. to 12-in. lathes made by Pittler, one of the best manufacturers, sell for 1000 m. to 1200 m. On account of their greater accuracy, American tools of the best makes will sell for better prices than German tools of the same type and size; but to say just how much more would be pure guess-work.

The German manufacturers are turning out far

better tools than they did in 1913-14. The designs of many well-known American tools are followed, some are faithfully copied and others adapted by the leading German makers. The list given below includes makers of characteristic types of American tools which had a ready sale in Germany before the war. General or standard machine tools, such as plain, vertical and Lincoln type milling machines, sensitive and upright drilling machines, vertical slotting machines, planers, shapers, engine lathes, tool grinders and many other tools, which were manufactured more or less along American lines before the war, have been taken up in increasing quantities since 1914 by a considerable number of German makers. It is not the intention to include any of these in the following list of machines copied or adapted:

Acme Machine Tool Co., Cincinnati: 2¾ in. geared head machine made by F. A. Scheu, G. m. b. H., Berlin.

Acme Machinery Co., Cleveland: Bolt machinery made by Concordia Maschinenbau, Halle a. S., and August Meiselbach Nachf., Leipzig.

Baker Brothers, Toledo, Ohio: Two sizes of keyseaters made by A. H. Schütte, Köln-Deutz.

Bilgram Machine Works, Philadelphia: Machines licensed to J. E. Reinecker, Chemnitz-Gablentz, are now also made by a firm in Leipzig.

Blanchard Machine Co., Cambridge, Mass.: Grinder brought out by Schuchardt & Schütte, Berlin, with round and square table.

Brown & Sharpe Mfg. Co., Providence, R. I.: Small screw machines made in large lots and first-class workmanship by Samsonwerk, G. m. b. H., Berlin; while Ludwig Loewe & Co., Berlin, have also brought out another machine of this type; the No. 2 surface grinder is also made in large lots by Samsonwerk in Berlin and sold at the price of 5750 m.; the same firm also makes the Brown & Sharpe No. 1 universal cylindrical grinder.

Bullard Machine Tool Co., Bridgeport, Conn.: While the Deutsche Niles has made a vertical turret lathe along the Bullard lines, this competition seems to have died away, as well as that of Sondermann & Stier, A.G., Chemnitz.

Cincinnati Bickford Tool Co., Cincinnati: Plain radial drilling machines of the latest Bickford type are built in quantities by Zimmermann-Werke, A. G., Chemnitz; and the smaller sizes of radial, 3 and 4 ft., are built by several firms in smaller lots. Upright drills of good design and workmanship are built by Gebr. Reinhold, Gera, as a specialty, and also by a number of other firms.

Cincinnati Milling Machine Co., Cincinnati: No. 1 tool grinder made by Fritz Werner, A. G., Berlin; also by Collet & Engelhard, Offenbach, a. M.; Schuchardt & Schütte, Berlin; while A. H. Schütte, Köln-Deutz, makes the No. 1½ size.

Cleveland Automatic Machine Co., Cleveland: Automatics built by Schubert & Salzer, A. G., Chemnitz; Gildemeister & Co., Bielefeld; A. H. Schütte, Köln-Deutz; and Leipsiger Werkzeug-Maschinenfabrik, A. G., Leipzig.

Fellows Gear Shaper Co., Springfield, Vt.: A machine very similar in working principle, using the same tools, is built by Max Röber & Co., G. m. b. H., Chemnitz; built in larger sizes than the Fellows gear shaper.

Fitchburg Machine Works, Fitchburg, Mass.: "Loswing" lathe made by Gildemeister & Co., Bielefeld; and by Heidenreich & Harbeck, Hamburg.

Gould & Eberhardt, Newark, N. J.: Shapers with the same characteristic details are made by several firms; the Samsonwerk, Berlin, have a new design, "with very small openings in frame," brake, splash lubrication, etc., with some details patented.

Higley Machine Co., South Norwalk, Conn.: Saws made by Ernst Krause & Co., Vienna; Otto Döring, Berlin; Irmischer & Co., Saalfeld, a. S.

International Machine Tool Co., Indianapolis, Ind.: Libby turret lathe (geared head) made by Zimmermann-Werke, Chemnitz.

Jones & Lamson Machine Co., Springfield, Vt.: Turret lathe advertised by C. G. Haubold, Jr., G. m. b. H., Chemnitz; and F. A. Scheu, G. m. b. H., Berlin.

Landis Machine Co., Waynesboro, Pa.: Bolt cutters made by Reinery & Co., Hagen, and Gustav Wagner, Reutlingen.

Landis Tool Co., Waynesboro, Pa.: Grinding machines made by Fritz Werner, A. G., Berlin-Marienfelde; Schubert & Salzer, Chemnitz; A. H. Schütte, Köln-Deutz; Schuchardt & Schütte, Berlin, and several others.

J. N. Lapointe Co., New London, Conn.: Broaching machines made by Dolze & Slotta, Coswig, Saxony.

R. K. LeBlond Machine Tool Co., Cincinnati: Tool grinder made by Zimmermann-Werke, Chemnitz, in large lots.

Mitts & Merrill, Saginaw, Mich.: Keyseater made by Elbe-Werke, Dresden; and Mammutwerke, Nürnberg.

National Acme Co., Cleveland: Mutiple-spindle automatic machines made by A. H. Schütte, Köln-Deutz; Gildemeister & Co., A. G., Bielefeld, Leipziger Werkzeug-Maschinenfabrik, A. G., Leipzig; the single-spindle Gridley automatic machine is made by Heidenreich & Harbeck, Hamburg; Gebr. Böhringer, Göppingen; Hasse & Wrede, Berlin; deFries & Cie., A. G., Düsseldorf.

New Britain Machine Co., New Britain, Conn.: Automatic machines made by Gildemeister & Co., A. G., Bielefeld.

Norton Co., Worcester, Mass.: Ludwig Loewe & Co., Berlin, is licensed to make Norton grinding machines.

Potter & Johnston Machine Co. Pawtucket, R. I.: This type of machine made by Herm. Schroers, Crefeld; deFries & Cie., A. G., Düsseldorf; Magdeburger Werkzeugmaschinen-Fabrik, Magdeburg; Leipziger Werkzeug-Maschinenfabrik, A. G., Leipzig; Zimmermann-Werke, Chemnitz.

Leading Manufacturers of Machine Tools

Among the leading German manufacturers of machine tools should be included Schuchardt & Schutte and Alfred H. Schutte. The former firm has its own factories and also controls the output of several others, making Blanchard and Landis type grinding machines, Cincinnati type tool grinders, turret lathes up to 2⅝ in. size, medium-sized milling machines, lathes, drilling machines, engraving machines, wood-working machines, and special machines for various types of manufacture; measuring instruments and tools, several types of small tools, grinding wheels, furnaces, etc.

Alfred H. Schutte has four factories—at Cologne-Deutz, Cologne-Ehrenfeld, Berlin-Treptow and Siegen-Marienborn. At Mr. Schutte's Cologne works, which are modern in every respect and employ 600 workmen, I saw the new Schutte four-spindle automatic. This machines has a single-pulley drive and geared head, a capacity for bars up to 2 in. in diameter, and is provided with all the means for rapid and accurate production found on various types of American multiple-spindle automatic machines, including spindles mounted in adjustable bearing boxes with end thrusts taken by ball bearings, an auxiliary tool head, a special arrangement for rapid drilling and ample provision for lubricating oil for the cutting tools. The price is 27,500 m.

Nearly all the German machine-tool builders made money during the war—some made large fortunes—but they now find them diminishing rapidly through heavy taxation, increased costs, and Governmental requirements in regard to the payment of wages when men are unemployed. The decline in earnings began with many firms before the war closed, and the earnings of Ludwig Loewe & Co. given below, are probably typical of many:

Net Profits and Dividends

1915	1916	1917	1918
4,338,000 m.	3,773,000 m.	4,485,000 m.	2,584,000 m.
35%	32%	32%	20%

Ludwig Loewe & Co. employed 4000 workers during the war, many of whom were women. They now employ about 2500, very few women. Their new building, begun in 1914, is not yet fully equipped, about half of it being devoted to the manufacture of milling machines. Dr. Waldschmidt is still the managing director, Mr. Bechstein occupying his former position, and Mr. Huhn being in charge of the mechanical department.

In 1917-18 the Siemens Works made a clear profit of 14,000,000 m.; but as the increase in wages this year already amounts to 70,000,000 m., it is evident that the showing for 1919 will be quite different.

The well-known firm of J. E. Reinecker, Chemnitz, Saxony, has had a similar experience of large profits during the war, followed by a difficult situation which has gone from bad to worse. The daily wages since last Fall have doubled, although the number of workmen has increased only slightly. Recently Mr. Reinecker declared that labor demands meant eventually the loss of their entire investment and that he wished to discontinue the business. As this is not permitted by law, he petitioned the National Assembly for permission to do so. Some people say this is only a bluff and was made for the purpose of changing from a corporation to a private firm, the taxes on the latter being less. My personal acquaintance with Mr. Reinecker inclines me to believe that he means business; in which case it does not indicate much faith in the future of the German machine tool industry.

A good deal has been printed about the future of the Krupp business and the great variety of metal goods that firm intends to manufacture. The name of Krupp has been so identified with war material that I was surprised to find that at the Essen plant, up to 1914, only about 20 to 25 per cent of the product was war material, the other 75 per cent or 80 per cent being for commercial and industrial purposes. The portions of the plant devoted to war material are now shut down, and there seem to be few arrangements completed for replacing the output of the closed portions. It is reported that they do not intend to take up the manufacture of machine tools, but are selling those in their equipment which they do not need; also it is said that they are considering manufacturing textile ma-

chinery, typewriters, calipers, gages, and measuring instruments.

The German designers have made few changes in machine tools, and few new machines have been brought out. On account of the tendency to copy American machines, or, if not in their intirety, to use their new points, our manufacturers are cautioned about accepting first orders for such machines.

The German Machine Tool Builders' Association

The German Machine Tool Makers Association numbered 72 before the war. It has now 320 members, and they apparently work together for much the same objects that our own association does, except that they are free to regulate prices to any extent they choose. Neither the Germans nor the English are so far advanced as we are in Government regulation of business. So they have some things to be thankful for. The members of the association employed about 70,000 men and a large number of women in 1917; 60,000 men and fewer women in 1918-19. I have a complete list of the members of the association and their products, but it would require too much space for this article. It will be sufficient to mention the number of makers of different classes of machine tools at the present time:

Engine lathes	90
Vertical boring mills	13
Cutting off machines	20
Horizontal boring machines	27
Gear cutting machines	19
Turret lathes, screw machines and automatics	37
Milling machines, all types	83
Drilling machines, all types	43
Planers, slotters and shapers	44
Grinding machines, all types	46

Machine Tool Dealers

As virtually no American tools have been coming into this market for three years there are, of course, no American machine-tool dealers in Germany. Even those who believe in American tools and would prefer to handle them, have been obliged to sell German, Swiss and Swedish products. The firm of Heinrich Dreyer has been liquidated and their fine show-room is now occupied by Zimmermann-Werke of Chemnitz. Thielicke & Co., formerly in Charlottenburg, have their salesroom and offices at Kaiser Wilhelmstrasse 2, just across from Dreyer's old location. Both the Thielicke brothers were in the army, but came through with slight wounds. Schuchardt & Schutte are in the same location in Spandauer Strasse. Oscar Burghardt, formerly manager of the Petrograd branch makes his headquarters here. Ernst Muller, formerly manager of the New York office, is still at Berlin in the same position as in 1914. Victor Giraud is still manager of the business.

Alfred H. Schutte has moved his Berlin wareroom from its former location in Alt-Moabit to Kroner Strasse, 52, near the business section. Adolph Siems is still manager. E. Sonnenthal, Jr., has moved to Ross Strasse, 22. In addition to an extensive dealer's business, this firm has now taken up the manufacture of lathes. Ernest Krause of Vienna has opened a wareroom at Friedrich Strasse, 123, principally for the sale of the product of his factory in Vienna. He has recently been employing 400 hands in his Vienna factory, making lathes, drilling machines, Higley saws, planers and shapers and turret lathes. Mr. Krause recently bought a planer plant at Cologne, which he will use for manufacturing machine tools. F. G. Kretschmer at Frankfurt a/Main, has been handling German tools during the war and has a large stock on hand. Both Mr. Koyemann and his associate, Mr. Huttner of Dusseldorf were in the army during most of the war, and are now re-establishing their business.

The Tariff and Patents

No definite policy has yet been decided on about the tariff, although it is said that a high protective duty will be placed on imports. The National Assembly being only a provisional body, it is likely that this question will be left to its successor, but there is a marked tendency among those having authority, to arbitrarily shut out all American machine tools, except those types which are not made here. I said to one of these gentlemen—"I have no authority to say that any American machine-tool manufacturer wishes to sell tools in this market, or that it is possible to do so with the mark at its present value; but—you all say you want to trade with America—how will you be able to if you shut out our products?" No satisfactory answer to this question was forthcoming.

There has been no change in the German patent law since 1909; and American manufacturers are advised to patent any improvements that are patentable—not only for their protection in Germany, but in other continental countries where German tools may be sold.

The Central European Nations

In what remains of Austria, the machine-tool industry is on an uncertain footing, due to unsettled conditions and a debased currency. In Hungary, the new government is too young for anyone to venture an opinion about the future, except that any government must be an improvement over what Hungary has had lately. In Prague business is said to be encouraging, and the Czecho-Slovak Government apparently is growing in strength. Machinery dealers in Berlin also say they are doing a good business with Finland.

Suspension Bridge at Detroit Is Proposed

DETROIT, Dec. 8.—Organization of a corporation under charter of the American and Canadian governments to build a steel suspension bridge across the Detroit River, connecting Detroit and Windsor, Ont., at a cost of about $28,000,000, is being considered by a group of Detroit and Canadian capitalists. Present prospects appear to be that the project will materialize. Formal announcement of the plans is expected within the next two or three weeks.

Promoting the project is Gustave Lindenthal, New York engineer, who came to Detroit several weeks ago and interviewed a number of Detroit capitalists.

The tentative plan provides for a double-deck suspension bridge across the river at its narrowest point, which would bring its Detroit terminal somewhere in the neighborhood of Twenty-second Street, it is believed. The proposed span would be able to handle railroad, street car, automobile and pedestrian traffic. The railroad tracks would connect on the Canadian side with the Essex Terminal Railroad, and on the American side with the terminal tracks of the Fort Street Union Depot Co., which handles the business of the Wabash and Pere Marquette lines.

It is proposed to build the bridge with one span 110 ft. above the water, which would permit any lake vessel to pass underneath with plenty of clearance. As soon as sufficient information has been obtained from the railroads that might use the bridge and from the Detroit United Railways Company, which operates the trolley lines on both sides of the river, it is probable that the matter will be taken up at Washington and Ottawa, where sanction to the plans will be sought.

An unprecedented industrial growth in both Detroit and the border cities, which seems in prospect, gives promise of a great increase in all kinds of trans-river traffic.

Effect of High Temperature on Duriron

WASHINGTON, Dec. 8.—The Bureau of Standards has studied the effect of prolonged annealing on high silicon cast iron for the Ordnance Department. The inspection division of the latter was interested in the noncorrodible iron called duriron (cast iron of the approximate composition—total carbon 1.18 per cent; graphite, 1.09; silicon, 13 per cent) and requested the bureau to determine the possibility of any changes in composition upon continued heating. The examination, says the report, showed that the continued heating for as long as 50 hr. at 1,000 deg. C, produced no essential change either upon the structure or composition.

The Pittsburgh Foundrymen's Association will hold its annual meeting and dinner at the Elks Club, Pittsburgh, on Monday evening, Dec. 15. The entertainment committee has prepared an attractive program of addresses, music and other diversions.

PRODUCTION INCREASING

Features of Mill and Furnace Operations in the Mahoning Valley

YOUNGSTOWN, OHIO, Dec. 9.—Last week Mahoning Valley mills commenced to feel the pinch of fuel shortage and open hearth schedules were curtailed Monday by the principal independents. The Carnegie Steel Co. is making the best operating showing this week, with the Ohio works and upper and lower Union mills in Mahoning county and the McDonald works in Trumbull county at 100 per cent. The Carnegie Steel Co. has as yet experienced no coal scarcity. November 25 the company blew in No. 2 blast furnace, which had been down for relining. All six stacks at the Ohio works are now in operation. District Supt. James H. Grose reports that out of a total operating force under normal conditions of 6700 about 6000 men are at work.

Employees Vote to Return

November 26, employees of the Brown-Bonnell finishing mills of the Republic Iron & Steel Co. voted to return to work, after being idle since Sept. 22. A majority of these workers were thrown into enforced idleness when the strike started because of the lack of common labor. A number were also influenced by their union sympathies. Between 850 and 900 men are affected by the vote. Union agitators endeavored to dissuade them from returning and succeeded in preventing any organized effort to go back to the mills until last week. At all the plants, men returned in droves and the normal working forces are being reached. Lack of coal, however, is retarding schedules and the shortage comes at a most inopportune time for the steel industry in the Youngstown district. It gives agitators an opportunity to interview the men under more favorable circumstances.

At least four weeks ago, most of the men on strike tired of the situation. From the first, leaders of the unions failed to live up to their promises to finance the strike and the radicalism of Foster and Fitzpatrick alienated many workers. Those who were at first active unionists and favored the strike were in frequent cases the first to return to the mills and get their jobs back. The opinion is shared here that the utter collapse of the strike has materially injured the cause of organized labor and has given it a setback in the steel industry from which it will not recover for years.

Agitators Are Cautious

Since the circulation of petitions here informing union agitators that their presence in the district is undesirable, strike leaders have been more than ordinarily cautious. They received a serious setback when Mayor A. W. Craver of Youngstown recently promulgated an order prohibiting meetings of strikers, claiming they incited to disorder. Union leaders have protested to Gov. James M. Cox of Ohio, who promised to hear their complaint, taken up by the Ohio Federation of Labor.

J. E. McCadden, district organizer for the American Federation of Labor, and two foreign labor leaders were arrested last week following a meeting of strikers at East Youngstown. They were detained under a new law against syndicalism in Ohio. It is charged they made syndicalistic and seditious utterances in their speeches. All three are held under bond for trial.

Another stabilizing influence has been the formation of a citizens' organization, presumably to preserve law and order, with over 2000 members. This organization is prepared to prosecute all strikers arrested for disturbance.

Picket lines have practically disappeared in this city and only a few scattered groups are noticed at the mill gates. In the past week, there has been little or no interference with men entering or leaving the plants. Despite this condition union leaders continue to inform the ignorant and the foreigners that the "strikers are winning."

After being on strike two weeks 100 employees of the Savage Arms Co., Sharon, Pa., have returned. They walked out in protest over refusal of the management to reinstate a discharged workman.

Smelter Will Require 13,000 Tons of Steel

WASHINGTON, Dec. 9.—Vice-Consul James H. Roth, at Callao, Peru, has sent to the Department of Commerce an official announcement by the Board of Directors of the Cerro de Pasco Copper Corporation that they have definitely decided to construct a new smelter at Oroya, Peru, to replace the old plant at La Fundicion. Preliminary work on this plant has been under way for some months, but a definite decision on the undertaking, which involves an outlay of approximately $9,000,000 was held in abeyance until a recent meeting of the board of directors. Over 13,000 tons of structural steel will go into the new plant, and for this work some 90 structural steel workers will be brought from the United States. Altogether, when the work is in full swing, the American staff will probably number between 200 and 300 men and between 3,000 and 4,000 native workmen will be employed. It is expected that the material will begin to arrive from the United States within the next few months, and that by the early part of 1920, construction will be fairly under way. The estimated time required for the completion of the plant is two years. The prime limits of the plant will be two blast furnaces and two reverberatories. The old plant at La Fundicion has five blast furnaces and four reverberatories, but the new units will have practically twice the capacity of the old. There can be handled 1,500 tons of ore per day at La Fundicion at the present time, while the minimum capacity of the Oroya installation, it is stated, will be 2,500 tons per day.

Plan for Disposing of Ships

A plan for disposing of the 2000 ships controlled by the United States Shipping Board has been proposed by Holden A. Evans, president Baltimore Dry Docks & Shipbuilding Co., Baltimore, which is radically opposed to that put forward by P. A. S. Franklin, president International Mercantile Marine. Although the Government has already sold a few ships at the rate of $225 a deadweight ton, Mr. Franklin is reported as having proposed that future sales be made at the rate of about $140 a deadweight ton, the Government allocating to the purchasers the ships unsold. Mr. Franklin claims the low price should be made in order that Americans can compete with British ships built on the Clyde.

Mr. Evans finds fault with this scheme, claiming a few big interests would purchase the bulk of these ships, centering the shipping industry in New York, Boston and Philadelpia to the neglect of ports such as Baltimore and San Francisco which have revived since the war shipbuilding boom. Mr. Evans proposes that the Government sell ships for $200 a ton the first two years, reducing the price to $175 for the next two years. At the end of five years, he proposes that the Government sell remaining ships at highest possible prices and quit the shipping business.

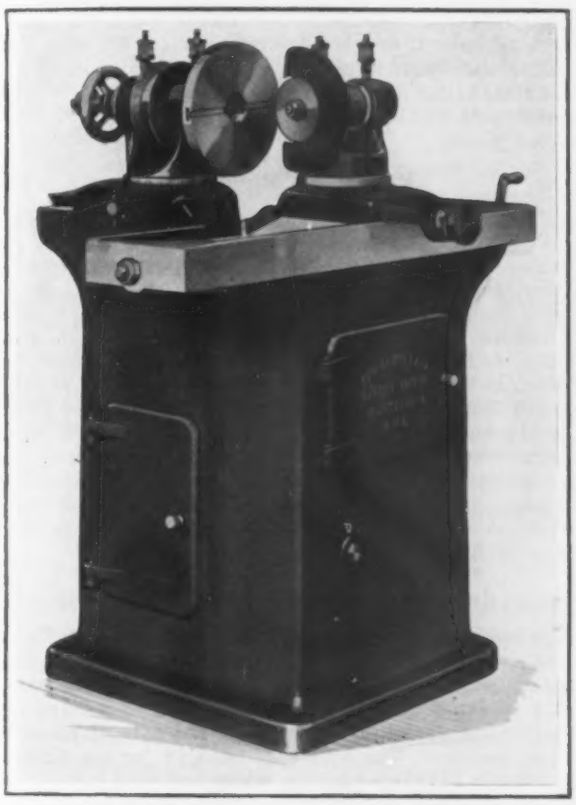
Mr. Evans claims that this five-year plan would give the American people time in which to be educated as to the value of a strong American marine and would afford time for American shipyards to become well enough organized to compete effectively with those of other countries.

The Federal Bridge & Structural Co., Waukesha, Wis., a fabricator of steel bridges and buildings, announces the appointment of M. E. Allen, formerly assistant general manager of the Birmingham Steel Corporation, Birmingham, Ala., as contracting engineer in charge of sales, with office in room 1228 People's Gas Building, Chicago. Mr. Allen was also formerly connected with the Central States Bridge Co., Indianapolis, and the Bally & Allen Co., Chicago.

Face Grinder for Work Up to 12 In. in Diameter

A machine especially designed for grinding metal slitting saws, hubs of milling cutters, faces of bushings, arbor collars, etc., is being marketed by the Cleveland Machine Tool Co., 3215 Superior Avenue, Cleveland. In plants where a number of Fellows gear shapers are in use, these grinding machines, it is explained, will be found especially useful for sharpening the gear shaper cutters.

The table is 42 in. long by 9¾ in. wide, has one V and one flat way, and is larger than the ways, so as to always cover the latter and keep them free from dust and grit. It is provided with a crank handle adjustment by which the arc of oscillation can be adjusted to the work to be ground. The design is such that a cutting fluid can be used if necessary. The table is oscillated by a crank disk driven by a worm and worm gear, thus to insure a firm and steady motion. The throw or arc of oscillation can be adjusted from nothing to 6 in., which means that work up to 12 in. in diameter can be handled. Six changes of feed are secured by a three-step cone pulley on the machine and a two-speed countershaft.



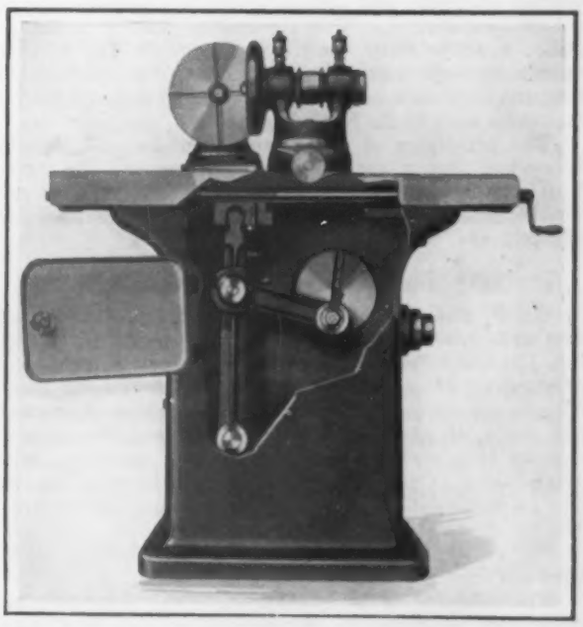
The grinding wheel head is fitted to a saddle which is secured to the main part of the column by a dovetail slide, and gibbed to provide adjustment for wear. The saddle has a lateral adjustment on the table of 2 in. and is designed to exclude dust from its bearing surface. The adjusting screw for this saddle is provided with a micrometer dial. The grinding wheel head is pivoted and can be turned to any desired angle, thus permitting the use of wheels of various shapes. The head is graduated in degrees for a space of 30 deg.

The grinding wheel spindle runs in phosphor bronze bearings which are adjustable for wear. A driving pulley 3 in. in diameter and with a 2 in. face is mounted on the spindle between the bearings. Large grinding wheel flanges are provided and a wheel guard large enough to accommodate grinding wheels 8 in. in diameter is made a part of the machine.

The work head is secured to the wing of the column by a dove-tail slide and rests on its own saddle, which has a longitudinal adjustment of 6 in. The saddle is fastened to the column by a hand clamping screw, thus to provide easy adjustment, and a gib makes this slide adjustable for wear. The machine will accommodate work 6 in. in thickness without overhang of the saddle. By allowing the saddle to overhang somewhat and by using a grinding wheel approximately 5 in. in diameter, work up to 10 or more inches in thickness can be handled. The work head is pivoted on the saddle and can be swung to any angle and is graduated in degrees.

The work spindle has a No. 11 B. & S. taper hole. The spindle runs in phosphor-bronze bearings which are adjustable for wear. The nose of the spindle is threaded to receive a 10-in. face plate which has two T slots at right angles to permit a rapid clamping of the work. Two draw bolts and ½-in. and 1-in. collets are furnished as regular equipment.

All cylindrical and flat bearings and all oil holes have dust-proof oil caps. The table and saddles are designed with a view of keeping their bearings free from dust and grit and the spindle bearings are protected by specially designed dust covers. A door in the front of the column permits access to the working parts of the machine for oiling and adjustment. A door on the side makes a large part of the interior of the column available as a storage place for tools, grinding wheels and attachments.



The Pneumatic Cylinder of the Clamping Device on This Heavy Duty Radial Is Located so as to Bring the Pressure Directly to the Point of Clamping and Eliminate a Number of the Usual Working Parts

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The second anniversary number of "Speed-Up," the official organ of the Submarine Boat Corporation, Newark, N. J., presents an interesting record of accomplishments. "A Farewell Message to the Newark Bay Shipyard" is had from Edward N. Hurley, former chairman of the United States Shipping Board; "The Two Years of Accomplishment" is outlined by Henry R. Carse, president; "How the Fabricated Ship Has Revolutionized the Shipbuilding Industry" is discussed by Henry R. Sutphen, vice-president, and "We Came, We Saw—Have We Conquered?" is the subject of an article by Beverly L. Worden, general manager.

The McClintic-Marshall Co., Pittsburgh, bought recently 100 acres of land adjacent to its Riter-Conley plant at Leetsdale, Pa., about 15 miles from Pittsburgh, at a reported cost of $330,000. The company has not made any definite plans of utilizing this property, but it will likely be used at some future time for additions to the Riter-Conley works, or perhaps for the building of new plants.

Insuring Proper Industrial Relations

In discussing "Personal Problems in Modern Industry" before the recent convention of the American Foundrymen's Association, C. D. Dyer, Jr., of Hunt & Dyer, Philadelphia, brought out that the three most important factors in securing and retainig a proper industrial relationship, are the establishment of a definite policy, which is not easy; the proper interpretation of such policy, which is even more difficult; and the practical application of details in connection therewith, which is vital.

"Too much consideration," he stated, "cannot be given to the problem of establishing a definite policy. To be of value, it must be formulated with the idea in mind of permanency, rather than expediency. It must provide sufficient elasticity to readily meet local or changing requirements. Any plan bordering on the paternalistic, philanthropic or welfare type of relationship, that has given rise to so much misunderstanding in the past, must be avoided.

"An adequate and sympathetic comprehension of mutual problems and mutual needs is a prerequisite to policy formulation. For the reason that it is essentially a proprietary program, dependent for success upon the co-operative spirit developed, it is only logical that the employed be given every opportunity of taking an active part in its formulation."

The principles of Americanization, he said, should be spread throughout the organization; and the practical application of any plan of industrial relations should provide for employment, service and hospital departments.

Training Foremen in Prentiss Wire Plant

G. W. Prentiss & Co., Holyoke, Mass., makers of iron and steel wire, have inaugurated a plan of training for their foremen and other factory supervisors. A group of 25 men has been formed to pursue a three months course in production methods, which comprises the study of specially prepared text, and the discussion of this material at six bi-weekly meetings held after hours in the plant. At each meeting a lecture will be delivered by a production man and the lectures will be followed by a round-table discussion. Included in the group, besides foremen, are the general manager and the superintendent.

The subjects to be studied include: How to promote team work in the shop; handling men in a way to increase production and promote harmony; how production should be organized; efficient purchasing, scheduling, routing, repairing, etc.; keeping down the overhead by stricter cost keeping, and major problems of management. The course is under the direction of the Business Training Corporation, New York.

Proposed Merger With Wickwire Steel Co.

It is understood that the meeting of the stockholders of the Clinton-Wright Wire Co., Worcester, Mass., to act on the proposed merger of their company with the Wickwire Steel Co., Buffalo, will not be called much before Jan. 1.

An agreement has been reached upon which the two corporations will consolidate, but there are still many minor details to be worked out before the final plan can be submitted to the Clinton-Wright stockholders.

Wide Fluctuations in Number of Employees

Possibly no better illustration of the fluctuating tide of labor at the various Eastern manufacturing centers during the past few years can be found than at Waterbury, Conn.

A movement is on foot in New England to secure the approximatae census of towns and cities for the purpose of boosting the industrial growth of such places. In the effort to secure an estimate of the population of Waterbury it was found that the Scovill Mfg. Co. before the war nominally employed 3500 hands; that during the war it steadily increased its working forces until, on Armistice Day, it was employing 14,000; that following the signing of the Armistice the working force was gradually reduced to 1,500; that since last spring it has been gradually increased again so that today the concern has more than 7,000 men on its books.

The Chase Companies, another brass manufacturer, before the war employed some 3,000 men; during the war it employed as high as 8,875; and today has 4550 on the books. The whole city's population is about 20,000 less than it was during the war, but more than 73,000 more than it was in 1910.

Alloy Steels for Light Armor

WASHINGTON, Dec. 1.—In co-operation with the Bureau of Mines and the Navy Department the Bureau of Standards is studying the properties of special alloy steels suitable for the development of light armor. The majority of these steels contain zirconium, while others contain molybdenum, boron, cerium, etc. About 150 ingots have been made by the Bureau of Mines experiment station at Ithaca, N. Y., and have been rolled into plates of ⅜ in. or ½ in. thickness at the Bureau of Standards. The properties of these are being thoroughly examined, including the mechanical properties, heat treated and annealed, hardness, resistance to impact, microstructure, chemical analysis and thermal analysis. In conjunction with the ballistic tests to be made by the Navy Department, valuable and useful data are being obtained for the design of light armor plates.

Report on Roumania

"Reconstruction in Roumania," a report prepared by C. C. Orghidan, president Roumanian Government Commission in the United States, and published by the American-Roumanian Chamber of Commerce, Woolworth Building, New York, presents the salient facts in regard to the present economic conditions in Roumania and the opportunities which are presented for American business. In 1913 Roumania with a population of 7,500,000 imported commodities valued at $118,002,568 and exported staple foodstuffs and petroleum products and other raw materials to a value amounting to $134,141,067. Of the goods imported, approximately 90 per cent was made up of finished manufactured articles. About 64 per cent was produced either in Germany or Austria-Hungary.

Japan Sustains Americans' Trademark Rights

A recent decision of the Supreme Court of Japan in Tokio, sustaining the right of the Miller Lock Co., Philadelphia, to the exclusive use of its registered trademark in Japan is considered a definite step toward reestablishing Japanese business in the esteem of occidental nations. The suit was brought by the Crown Lock Co., a Japanese concern, which had been restrained by the Japanese Patent Office, Tokio, from use of the Miller trademark, consisting of the name "Miller" set in a scroll. The Crown company had been for some time manufacturing locks marked with a scroll bearing the names "Crown" and "Million," and obviously intended as an imitation to sell on the good will built up by the Miller Lock Co.

Extensive Housing Plan

The Norton Co., Worcester, Mass., will start immediately upon an elaborate plan for housing its employees, which will supplement in a large way the colony of 58 single houses erected on Indian Hill, Greendale, five years ago. The new neighborhood will be on the opposite slope of the hill. There will be 100 single and two-family houses, two boarding houses, to lodge and board more than 100 unmarried male workers, and a community house, which will be the central feature of a park into which the large area will be laid out. In addition there will be a coöperative store conducted on a large scale. The project involves the expenditure of $500,000.

The Bridgeport Drafting & Engineering Co. Bridgeport, Conn., installed a catalogue-filing system, and would like to hear from concerns handling tool and shop equipment, structural steel and sheet metal work.

Basing Point Controversy Is Submitted

Federal Trade Commission Hears Arguments and Takes Matter Under Advisement—Long Period May Elapse Before Decision is Rendered

WASHINGTON, Dec. 9.—The Federal Trade Commission has taken the Pittsburgh basing point controversy under advisement. Even a preliminary decision, however, is not looked for before some time late in the spring, and then it is likely that it will be only the beginning of a real fight. For the commission has not even determined whether it has jurisdiction in the case.

A high-priced array of legal talent spent five days last week arguing the case before the commission. They covered little ground not already covered in the briefs and declarations which have been filed. They went over the whole fabric of the complicated history of Pittsburgh basing and all its applications to the iron and steel industry. But at the end of the five days all the commission could announce was that it would let the parties interested know when a decision might be expected.

The commission has given no ground to speculate on what its decision will be. But there seems to be a general expectation that the commission is not ready to drop the proceeding, and will at least issue the necessary formal complaint to go into the exact details of the case. It has heard no testimony, so far — only arguments. As a result, it seems likely that some kind of further proceeding will follow, to permit the taking of sworn testimony and the gathering of actual statistics. If that is done, it will take at least another year before a genuine order could be issued by the commission. The plea of the Western Association of Rolled Steel Consumers is that the commission issue an order to direct the abandonment of the Pittsburgh basing point plan of selling.

How Many Basing Points?

Several times during the hearings, there have been suggestions that if the Pittsburgh base is retained, Chicago, Duluth, or Birmingham, or all of them, be also made basing points. It seems likely, however, that if the commission rules adversely to Pittsburgh, it will prohibit all basing points rather than order the creation of new ones.

This is based on the fact that throughout the arguments, the commission seemed particularly anxious to determine whether the existence of the Pittsburgh base was the result of a natural economic law, or whether it was the result of arbitrary agreements by producers. This left the inference that if it were not an ordinary and natural condition, the commission would be willing to interfere to break it down.

One of the important features of the whole hearing was the fact that a decision in this case will naturally bring with it similar decisions in the case of all the other industries which have basing points. None of these was represented, but the commission has been keeping in touch with the situation from that standpoint.

Case "Not Even Begun"

Although Chairman Murdock has been careful to emphasize that "the case has not even begun," the record in the Pittsburgh controversy has already become voluminous. This record has now been turned over to M. F. Hudson, the acting chief examiner of the commission. He will abstract it and work out all the questions of law and fact that are applicable to the case. It is expected that the commission will have to put its own experts to work on some of the features of the case, particularly to gather statistics as to production and consumption of steel in the various states, and the prices that have been applied. This alone will require several months.

Then Mr. Hudson's report will be turned over to the Board of Review of the commission. This consists of Adrian S. Busick, chairman, T. M. Robertson, and W. T. Roberts. With their attorney, W. R. Turner, they will spend another month or so, proving up all the statements, and determining upon a recommendation to the commission. Not until they have agreed upon such a recommendation will the case again be in the hands of the commissioners themselves. The statement by the Board of Review will first be given to Commissioner Houston Thompson, who will again study the case and decide upon a recommendation to his brother commissioners.

At that time the Board of Review probably will also appear before the commission, and there will be further deliberations before the commission can make a public decision.

If it decides that it has no jurisdiction, that the case calls for no interference on the part of the commission, that ruling will end the case. Nor is there any provision for an appeal to the courts. If, on the other hand, it determines that it has jurisdiction and that the case merits a real trial, that it "has reason to believe" that the Pittsburgh basing practice constitutes "unfair competition," or an "unfair trade practice," it will decide to issue a formal complaint against the United States Steel Corporation and the other defendants who are named in the present petition. Even the drafting of that complaint probably will require some time, for the commission will order one drawn up and then—if it follows its usual practice—debate for several sessions upon the final terms of the document. Not until that complaint has been issued will the case have legally "begun."

Once that is issued, the defendants will have a month or 40 days to file their answers, before formal taking of testimony is begun before the board's examiners. This will require several months more, and in all it is likely that six months will elapse before the commission will be ready to rule upon the case made up by the examiners. If, after all these proceedings, it determines that the practice is illegal, and issues an order to "cease and desist," the defendants will still have an appeal to the United States courts.

There is no question that the case is the most important and far-reaching that has been brought before the commission.

Many Interests Represented at Hearing

The representatives of the organizations and corporations that favored the application for a commission order against the Pittsburgh practice, who appeared at the hearings, were:

John S. Miller and Don C. Wray, Chicago, for Western Association of Rolled Steel Consumers.

Frank S. White, Birmingham, Ala., for Birmingham Civic Association and Birmingham Steel Base Bureau.

Charles L. Harold, Birmingham, Ala., for Southern Association of Rolled Steel Consumers and the Birmingham Civic Association.

Henry C. Flannery, Assistant Attorney General, St. Paul, Minn., for State of Minnesota.

Clifford L. Hilton, Attorney General, St. Paul, Minn., for State of Minnesota.

H. G. Pickering, of Pickering & Rieser, Superior, Wis., for the Superior Commercial Club.

J. A. Smith, Attorney General of Alabama, Montgomery, Ala., for State of Alabama.
T. T. Hudson, Duluth, Minn., for Joint Committee of Civic Organization of Duluth, including manufacturers of fabricated steel products.
Fred G. Moore, City Attorney, Birmingham, Ala., for the city of Birmingham.
Elliott Cheatham, Atlanta, Ga., for Southern Association of Rolled Steel Consumers and Southern Association of Steel Fabricators.
Charles P. Craig, Chairman, Duluth, Minn., for Joint Committee of Civic Organizations of Duluth.

The opponents of the application were represented as follows:

Charles T. Hopkins, Atlanta, Ga., for Atlantic Steel Co.
Cadwalader, Wickersham & Taft, by C. W. Wickersham and Walter B. Howe, New York, for Lackawanna Steel Co.
L. C. Boyle and Robert Ash, Washington, for Oak Flooring Manufacturers' Association of Chicago.
Willis L. King, T. E. Hackett and George C. Wilson, Pittsburgh, for Jones & Laughlin Steel Co., Pittsburgh.
Frederick A. Joss, Indianapolis, for W. J. Holliday & Co., Indianapolis, fabricators.
John J. Corbin, Sharon, Pa., for Petroleum Iron Works Co.
Henry Russell Platt, of Mayer, Meyer, Austrian & Platt, Chicago, for Inland Steel Co.
L. A. Manchester and W. J. Morris, Youngstown, Ohio, for the Youngstown Sheet & Tube Co.
W. A. Collings, Kansas City, Mo., for W. A. Collings Co.
A. H. Cordery, Philadelphia, for the Phoenix Iron Co.
N. L. Moon, representing W. W. Lukens, vice-president, Philadelphia, for Alan Wood Iron & Steel Co.
R. V. Lindabury and N. W. Corlett, New York, for the United States Steel Corporation and subsidiaries.
Hoyt A. Moore, of Cravath & Henderson, New York, for the Bethlehem Steel Co.
E. L. Herndon, Pottsville, Pa., for the Eastern Steel Co.
John Walsh, attorney, Washington, for Petroleum Iron Works Co., Sharon, Pa.
Richard Jones, Jr., Youngstown, Ohio, for Republic Iron & Steel Co.
Charles M. Thorp, Pittsburgh, for Weirton Steel Co.
A. T. Cobb, Rochester, N. Y., for Office Equipment Traffic Association and Yawman & Erbe Mfg. Co.
George W. Connors, Birmingham, Ala., for Connors-Weyman Steel Co.
James Bowron, president, and H. Sanborn Smith, vice-president, Birmingham, Ala., for the Gulf States Steel Co.
Alfred L. Geiger, attorney, Washington, for Gulf States Steel Co., Birmingham, Ala.
Willis F. McCook, Pittsburgh, for Pittsburgh Steel Co.
Chadbourne, Babbitt & Wallace, New York, for Midvale Steel & Ordnance Co.
G. H. Jones, first vice-president, Chicago, for Inland Steel Co.

Chairman Murdock States Commission's Policy

"It is the intention of this commission," said Chairman Murdock, in opening the hearings, "that everyone here who desires may be given as full and complete hearing as is consistent with the reasonable expedition of the case.

"Under the commission's organic act, Congress declared that unfair methods of competition were unlawful, and said, supplemental to that pronouncement, that whenever the commission shall have reason to believe that an unfair method of competition is being used or has been used in commerce, it shall, if it believes it to be in the public interest, cause a complaint to be issued. Thereafter, there shall be a hearing upon that complaint on answer.

"After that hearing, the matter again comes before the commission, and if the commission, after hearing, concludes that it shall confirm its original reasonable belief about issuing the complaint, then an order issues against the respondent to cease and desist from the practice complained of. Now that proceeding up to that time has not been a court proceeding. There has been no day in court. This is an administrative body, and all that we have done up to that point is the action of an administrative body.

"If the respondent feels that the order to cease and desist is not grounded in law and in fact, he may appeal to the Court of Appeals, and then he has his day in court."

"And thence to the Supreme Court," said Mr. Lindabury.

"And thence to the Supreme Court," assented Commissioner Murdock.

Claude R. Porter, chief counsel of the commission, went into greater detail in explaining the exact procedure. The two sides then agreed upon a program of nine hours hearing for each, Attorney John S. Miller to control the time of the petitioners for the abolition of the Pittsburgh basing point, and Attorney R. V. Lindabury for the Pittsburgh side of the controversy. Mr. Miller went over much of the ground covered in the original complaint of the Western Association of Rolled Steel Consumers. He attacked, particularly, the suggestion that the Pittsburgh basing policy "stabilized" steel prices.

Destroying Competition

"The law of supply and demand, and the law of competition do not call for stability," he said. "The moment you stabilize prices and make them uniform and steady for all time, you have destroyed that competition. The stabilizing of prices has to be done by natural law. It can not be done arbitrarily, because the law of normal competition is the law under which prices are more or less unstable. If they get too high, competition brings them down. Where it is left to the cost of production plus a profit, the natural laws of competition will not stabilize the price up here. It will tend to get down to the cost plus and a profit for the most inexpensive producer, and it will so benefit the consumer."

H. E. White, assistant to the counsel of the Western Association of Rolled Steel Consumers, was then put on the stand to exhibit a map showing the graphic results of the Pittsburgh basing policy, which he described, as well as a long series of detailed statements concerning freight rates and records of invoices and shipments in various territories.

"It is not entirely clear to me from the counsel's argument, and the papers they have furnished," said Mr. Lindabury, "whether or not they desire this commission to establish what they call a Chicago basing point. I should like to know from the counsel whether it is their position or claim or argument, that this commission should by order establish a Chicago, or a Duluth, or a Birmingham base, or that it should stop short of any attempt at the establishment of any of these bases in the order which it is asked to make."

Not Asking for Chicago Basing Point

"I undertake to say," replied Mr. Miller, "that we were not asking for any Chicago basis; that we had a complaint against a specific evil practice as we conceive; and that we come here under the provisions of the act of Congress, asking this commission to issue a complaint the result of which, if we should succeed, would be an order on the respondents to cease the practice. That does not involve making any Chicago base at all."

An "Evil Practice"

"But you speak also for Duluth and Birmingham?" questioned Commissioner Murdock.

"I think so," said Mr. Miller, "at present. We are here now to get rid of this Pittsburgh basing practice as being unlawful. We are here for such an order as the commission has the power in those cases to give. We want to dispose of this Pittsburgh basing. If that is met by any other evil practice, if any other evil practice is substituted or put in its place, we will be prepared to meet it then.

"It is quite clear," said Commissioner Colver, "that the method of approach that has been selected here only leaves opening to the commission under the law for a negative ruling against the Pittsburgh basing point, which, as I take it, is the assumption of the payment of a freight rate which, in fact, has not been paid. That is all we can do. If anything formative were wanted, you would have to go to the Attorney General under another section of the Federal Trade

Commission act, and upon application of the Attorney General the Federal Trade Commission would also have power to investigate and make recommendations for the readjustment of the business of any corporation alleged to be violating the anti-trust acts, in order that the corporation might thereafter maintain its organization, management and conduct of business in accordance with the law. In that case, the commission would be able to act formatively but only by way of recommendations. In this order, we can only act negatively."

Attorney General Hilton of Minnesota emphasized the interest which that State has in the assertion. "Minnesota is interested both as producer and consumer," he said. "It is interested because it is a large producer of steel products. In its good-roads movement it will require the use of approximately 60,000 tons of steel during the next five years. This amount of steel, if purchased at the steel mills of the Minnesota Steel Co., at Duluth, Minn., would cost the state $594,000 less than if it were purchased at Pittsburgh, if the same can be produced at Duluth at as low cost as at Pittsburgh.

"I believe, and it is generally believed by the people of Minnesota, that, owing to the cheap water transportation and the low cost of delivering coal and limestone at Duluth, and by the nearness of the iron mines of northern Minnesota to Duluth, steel can be manufactured at Duluth at as low or lower cost than at Pittsburgh. I therefore submit that it is to the interest of the people of Minnesota and of the Northwest to have the present system abolished, and that consumers of steel in Minnesota and the Northwest be given the right to purchase primary steel products from the mills at Duluth at the cost of production with a reasonable profit. The ultimate consumer is also involved in this. Every man, woman and child in the State of Minnesota contributed directly or indirectly to this excess cost of steel products."

"Arbitrary, Unjust and Unfair"

"The present pricing system of primary steel products," said T. T. Hudson, as representative of the Joint Committee of Civic Organizations of the City of Duluth, "is arbitrary, unjust, and unfair and tends to create a monopoly in the steel business of the country in the direction of the corporations engaged in and around Pittsburgh, whose interests have confederated them together for the maintenance of this system.

"A system of pricing steel which tends to concentrate all steel plants, furnaces and mills at one point in the United States, is uneconomic and unjust to all other plants in the United States which are favorably situated for the production of base steel products and of finished products. It discourages the development of other sections and lessens the market for all agricultural products therein. It multiplies the volume of transportation needed to supply all such other territory, an element which very largely increases the cost of fabricated products to the ultimate consumers. It draws to certain sections vast numbers of one class of people to engage as employees in but one occupation so they predominate the thought of the communities in which they live, which creates the conditions of fomenting strikes, tie-ups and discontent because of fancied or real grievances without the beneficial influence of citizens engaged in other occupations and businesses, who have their own life problems, which is the best leaven for insuring orderly communities. It congests traffic and transportation facilities at such points, causing loss and delays in delivery, and is wasteful and unsatisfactory."

President George M. Gillette, of the Minneapolis Steel Machinery Co. of Minnesota, also presented the Minnesota point of view; while H. G. Pickering appeared in behalf of the Superior Commercial Club, Superior, Wis.

Then came the companies of the Southern steel consumers, with Birmingham in the lead. Elliott Cheatham appeared for the Southern Association of Rolled Steel Consumers and the Southern Association of Steel Fabricators.

"Birmingham is unique," said Mr. Cheatham, "as the only place in America where the three raw materials going into the making of iron and steel are found together. In Birmingham the limestone and coal and the ore are all together, and to bring them into the furnaces requires nothing more, practically, than switching. The Tennessee company, which belongs to the United States Steel Corporation, makes a normal Pittsburgh profit on its sales down there. In addition to that, it makes a 26 per cent profit on its cost, because, as Judge Gary has said, steel can be produced in Birmingham at 26 per cent less than in Pittsburgh. In addition to these two things, it makes $11.50 a ton on all sales made down there on the full Pittsburgh price plus. But when they buy scrap steel, they turn it around and subtract the freight rate from the Pittsburgh price, so they make an additional profit there. There has been much talk about chaos if the Pittsburgh basing point is abolished. That is all bugaboo. We in the South have often departed from the sacred Pittsburgh basing in part, and there has been no trouble of any kind."

J. H. Brown of the International Shipbuilding Co., at Pascagoula, Miss., and Charles L. Harold of the Southern Association of Rolled Steel Consumers and of the Birmingham Civic Association also spoke for the southern consuming interests. W. T. Beatty, president of the Austin Mfg. Co., Chicago, presented the case of the individual Chicago fabricators.

Mr. Lindabury Speaks for U. S. Steel Corporation

The chief argument for the Pittsburgh defenders was made by R. V. Lindabury, counsel for the United States Steel Corporation. He went into considerable detail, both as to the industrial situation that had brought about the Pittsburgh basing practice and as to the law under which the present proceedings were being held.

"The counsel for the other side," he said, "have disclaimed here any idea that you should fix either Chicago, Duluth, or Birmingham as basing points, and have constricted their application practically for an injunction to restrain, or an order to require the discontinuance of the practice of making Pittsburgh a basing point. They do not even ask you to fix mill base."

"The trade will fix the mill base," interrupted Mr. Miller.

"Perhaps that would result," admitted Mr. Lindabury. "It seems to me that instead of asking the commission to promote competition, to free competition from any shackles that have been put upon it, by agreement or otherwise, they are asking for an order to shackle competition, to create an artificial situation, instead of to discharge one that is contrary to the whole principle upon which our industrial relations are carried on. This condition of which they complain is the result of that competition which this Government directs, encourages and declares to be the policy of this country. And any such order as they attempt to make would be but to put a fetter upon that com-

petition and create an artificial situation which ought not to be done, and which it was never intended or expected that this commission or any other like commission would create.

"Suppose you could make some such order as these gentlemen ask, and there were some compelling influence that required the Chicago manufacturers to sell at Pittsburgh price, less freight, it being conceded for the purpose of argument that they manufacture as cheaply in Chicago as they do in Pittsburgh. What would be the result? Why, it would be that one-half of these Chicago fabricators would get their steel at $5.50 less than the other half. I do not know whether these would get any of it, because there are such great users of steel out there as Deere & Co., the Moline Plow Co., the Oliver Plow Co., the J. I. Case Co., and I suspect they would contract ahead with the Chicago mills for their total production. Fifty per cent would be pretty quickly taken up. The other half would have to pay the Pittsburgh price with a freight rate of $5.50 a ton more. Competition between them would, of course, be destroyed, and you would have by force of law the very discrimination which the Clayton law was passed to prevent."

A Competitor of Steel Corporation

"I represent a competitor of the Steel Corporation," said H. R. Platt. "I speak for the Inland Steel Co. But with these other companies on this side of the table we believe that to grant this application will be an injury and not a benefit to the country and to the trade, as well as to our individual clients. But we are glad to submit this question to the jurisdiction and the consideration of the commission, without reservation of any kind. We say this because we believe that this question is an economic one, and that for the purposes of recommendation—because we believe that for practical purposes your power will be limited to a recommendation—we believe a careful, impartial investigation by a body whose impartiality cannot be questioned should be welcomed as tending to some extent to quiet the fears of any person or body of men who think they are being unjustly discriminated against. We do not share the fears expressed in the answer of some of our competitors that this commission can bring about chaos or can destroy any well established business which has behind it sufficient resources to ride by the temporary troubles that might be brought about by an erroneous decision."

"The 6,000,000 tons produced in the Chicago district," said Frank H. Scott of the Steel & Tube Co. of America, "cannot possibly supply the demand of that district. As to the injury which would be done by such an order, the independents would be at a great disadvantage as against the United States Steel Corporation. The latter has mills in Pittsburgh, Birmingham, Joliet, South Chicago, Gary, Milwaukee and Duluth. It can always sell at each of these places without having to pay freight on its products from anywhere else."

"We are not engaged in an unlawful act," declared L. A. Manchester of the Youngstown Sheet & Tube Co. "We are merely following the natural development of the steel industry."

C. W. Wickersham, who appeared for the Lackawanna Steel Co., fortified his arguments with maps and documents. He declared that the Chicago district produced less than 45 per cent of the requirements of the Western district, and asserted that the abolition of the Pittsburgh base would prevent his company from selling west of Buffalo.

"Judge Miller's clients," he said, "are the only people in the United States who would profit one penny by any change."

James Bowron, president Gulf States Steel Co., put into the record a lot of historic data from his own experiences in the Southern iron and steel industry. In answering the commission's inquiry as to when the Pittsburgh base originated, he said:

"I remember having seen some reference in THE IRON AGE to Pittsburgh base as early as 1892."

None of the earlier speakers could touch upon an earlier reference.

For the Bethlehem Steel Corporation, Paul Cravath tried to explain why rails had never been sold on a Pittsburgh base. He ascribed this to the fact that the railroads were themselves the purchasers, so that freight rates played no part in the price from any source. He also pointed out that prior to the anti-rebate laws the railroads used shipping favors as part of their rail purchasing inducement. Rails, he said, also were not shipped to a definite point, but scattered along the right of way, where needed.

W. A. Collings, Kansas City, and John Walsh of the Petroleum Iron Works, Sharon, Pa., concluded the arguments in defense of Pittsburgh. Attorney Miller made the concluding arguments for the applicants, answering the declarations of the Pittsburgh defenders. He brought in some new evidence concerning plate makers' agreements on extras and laid new stress upon the fact that pig iron is not sold on the Pittsburgh base. O. F. S.

Machine Tool Situation in Germany

WASHINGTON, Dec. 9.—Germany has already become a dangerous competitor in the machine tool field, according to a report sent to the Department of Commerce by Trade Commissioner Wilbur J. Page. This is based on a visit of Mr. Page to the October fair at Leipsic, Germany, which, he says, had more than 10,000 exhibitors and 18,000 visitors. Among the latter were some 7000 foreign buyers.

"From the point of view of the German expert," says Mr. Page, "probably the most important exhibits were those of the technical section, including many types of new machine tools, mechanical and electrical devices, and novelties. In this industry the Germans were in position to fill orders quickly, and in many cases had considerable stocks on hand, due to the fact that, firstly, they had not been short of iron ore and coal during the war to the same extent as industries relying on foreign raw materials, and, secondly, there was little home demand to be met. The mechanical engineering industry is concentrating as much as possible on fine mechanical precision machinery and articles in which the raw material and coal used bear as small a percentage as possible to the value of the finished article. The accuracy of the work done by the machinery exhibited and the finish of the machines themselves left nothing to be desired except that every effort was made to avoid the use of brass."

Mr. Page summarizes his general impression of the machine tool situation in Germany as follows:

1. Delivery from stock can in most cases be obtained for machine tools. In this connection, the representative of a large Dresden house stated that his firm had actually in stock 25 to 40 of each type, from the largest to the smallest machine.

2. Prices are approximately 200 to 400 per cent above pre-war prices.

3. The German firm arranges all the necessary export regulations and shipping, leaving the import side to the importer. Cash must be deposited in a German bank on receipt of advice that the goods are ready to be despatched, or, in some cases, that they have already been forwarded.

4. For the last six months a considerable amount of business has been transacted with Holland, Norway, Spain and North and South America.

5. A very large proportion of the goods sold during the last six months has been for export.

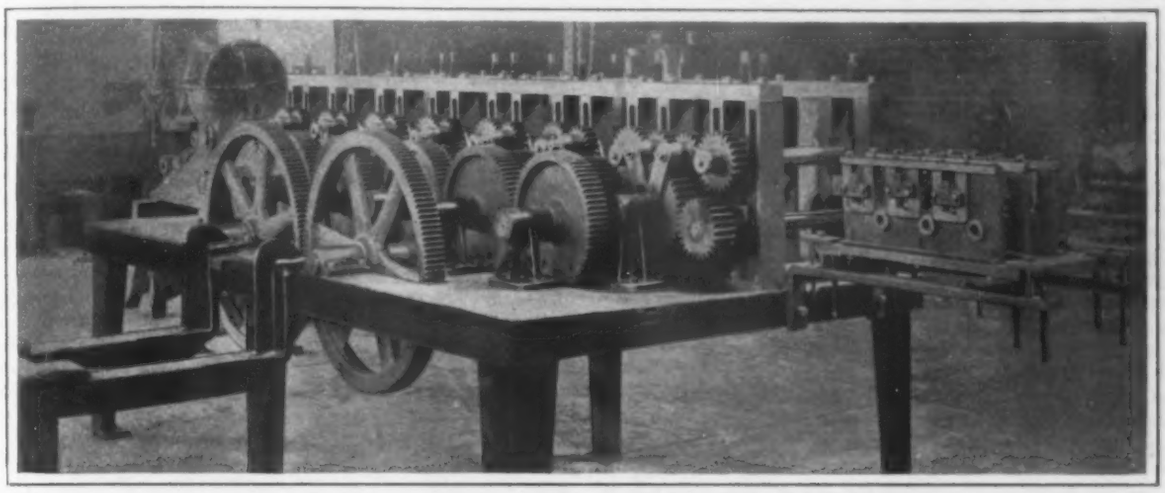
6. The chief factor limiting output is coal.

7. Much specialized new machinery was seen. In many cases the Germans are willing to sell the covering patents to foreign manufacturers.

New Tube Rolling Machine

A machine designed for rolling tubing and molding, particularly for the automobile field, has been brought out by the United Machinery & Mfg. Co., Canton, Ohio. The machine can be used for the manufacture of open seam, locked seam and welded tubing, round, square, or in any other desired section, or molding in any shape. In manufacturing the welded tubing a butt seam is made and the operation of welding is performed by an electric or other type of butt welder suitable for automatically welding light sections.

The machine consists of a table on which are mounted eight pairs of housings that carry the bearings for the roll spindles that are driven from the motor through reduction gears. The final drive of the upper set of spindles is by a peculiarly designed system of idler gears and links which permits the adjustment of the position of the upper row of spindles to any height desired, depending on the diameter or form of section that is being rolled. It is also possible to adjust the height of any one of the roll spindles without changing the position of the other spindles, when this is desired in rolling peculiarly shaped sections. The bottom spindles are also adjustable over a limited range. It is pointed out that these two adjustments make the mill one of unusual flexibility.



Flat Strip Stock Up to 13 In. in Width Is Formed by This Machine Into Tubing or Molding of Any Section or Shape Desired. Adjustments provided for the rolls are pointed out as giving unusual flexibility, and the arrangement of the rolls in graduated diameters is explained in producing a drawing tendency on the stock thus to prevent buckling

The stock which enters the first set of rolls as a flat strip is gradually formed as it passes through the various sets of rolls and has reached its final form on emerging from the last set. A feature of the rolls is that the circumference of each set is a few thousands of an inch larger than the set preceding it, producing a drawing tendency on the stock and preventing danger of buckling.

The mill is furnished either with rolls of high carbon steel, heat treated and ground, or with low carbon open hearth steel rolls, carbonized and ground. Cast alloy steel gears are used and the spindles are of crucible tool steel, heat treated and ground. The spindles and gear shafts run in phosphor bronze bushings.

Feed rolls are provided to guide stock in the machine. These consist of two horizontal rolls and two vertical rolls provided with adjustable housings in order to accommodate stock of different widths and thicknesses. At the outlet end there is a straightening device, consisting of three housings and rolls. The intermediate housing can be adjusted, changing the distance between housings to accommodate the size of the section that is being rolled. The mill will roll any desired section up to one requiring stock 13 in. in width.

It is stated that it will roll tubing 2 in. in diameter or its equivalent in any other section at the rate of 300 in. per min.

Myron Kennedy and Clarence Reiter have organized the Kennedy-Reiter Manufacturing Co. at Niles, Ohio, to manufacture metal specialties.

The Foreigner and Safety Work

A means for securing the co-operation of foreigners in safety work was discussed in a paper, "New Ways to Put Safety Across in a Steel Plant," presented by H. P. Heyne, safety inspector United Alloy Steel Corporation, Canton, Ohio, at the eighth annual safety congress of the National Safety Council, Cleveland.

"In our several departments where the workmen have little or no knowledge of the English language," Mr. Heyne stated, "we appointed the more enlightened foreigners on the mill safety committees, through an interpreter who explained to them just what was expected of members of the safety committee, and also that the safety committee button was presented to them in recognition of their ability in promoting safety among their fellow employees.

"The committee button turned the trick, for the men felt that they were being considered, in assisting us in the work. The number of lost time injuries, those extending beyond balance of the working turn, was reduced 14 per cent for the first half of 1919 as compared with that for 1918 (our reduction in 1918 as compared with 1917 was more than 50 per cent), which was partially accomplished through getting the foreigners more interested in safety work. In other words, these fellows had a greater chest expansion. However, we made it clear that they must approach their fellows in a proper manner, otherwise they would not obtain their co-operation; and we made them feel that they were safety investigators and were considered a part of the safety organization.

"The safety button is a badge of an accident preventionist, and must not be construed by the men as having any authority invested in them, other than to signify to their fellows that they are safety investigators. The button which, of course, was not presented until after the men had an understanding as to what was expected of them, had a good psychological effect."

The German Iron and Steel Output

The output of pig iron and steel in Germany for nine months of this year is as follows in metric tons, according to the German Association of Iron and Steel Producers:

	Pig Iron	Steel
January	506,185	477,149
February	475,586	529,913
March	558,788	654,893
April	439,975	426,910
May	524,986	598,377
June	531,632	643,779
July	580,819	796,331
August	568,785	739,683
September	531,167	737,516
Total	4,717,923	5,604,551

The corresponding output in 1918 to Oct. 1 was 10,067,657 tons of pig iron and to Oct. 1, 1914, 12,018,940 tons. The total steel output for 1918 was about 13,750,000 tons.

Taylor Society Holds Annual Meeting

Scientific Management Organization Considers Washington Industrial Conference and Coal Strike—Plans for Courses in Universities

THE Taylor Society, organized a number of years ago to promote scientific management, held its annual meeting in the Engineering Societies Building, 29 West Thirty-ninth Street, New York, Dec. 5 and 6. The first day was devoted to committee meetings, with a dinner and business meeting in the evening, and the second day to a series of papers and discussions in three sessions. The meeting was particularly timely because two of the speakers were representatives of the public group at the Industrial Conference at Washington and gave inside facts concerning it; and because a mining engineer brought out unpublished facts concerning the bituminous coal situation and the reason for the strikes.

The general attitude of the assembly was that of a sympathizer with labor in the present industrial conflict, collective bargaining was indorsed, and both trade unions and shop unions were favored in principle, the one to supplement the work of the other. The Government was criticized in not having recognized the management end of industry along with capital, labor and the public. The most prominent figure was that of Henry S. Dennison, Dennison Mfg. Co., Framingham, Mass., who occupied the double role of president-elect of the Taylor Society and speaker at the most important session. Several were present who had attended the annual meeting of the American Society of Mechanical Engineers and they made references to this meeting. The very principle for which the society stands, scientific management, was lacking in the handling of the slides for the screen with which several papers were illustrated, as the wrong slides were frequently shown, thus losing much valuable time. An anti-climax was reached when the next to the last speaker in discussion alleged there was too much dishonesty among managers, which brought forth a rebuttal from the next speaker, the arguments tending to leave an unpleasant taste to the conclusion of the meeting.

The New Officers

The following officers were elected for the ensuing year: President, Henry S. Dennison; vice-president for two years, Richard A. Feiss, Joseph & Feiss Co., Cleveland; vice-president for one year, Boyd Fisher, supervisor of personnel, Aluminum Castings Co., Detroit; treasurer, Edward W. Clark, consulting engineer, Philadelphia; directors for two years, D. M. Bates, Lewiston Bleachery & Dye Works, Lewiston, Me., and Fred G. Coburn, naval aircraft factory, League Island Navy Yard, Philadelphia; directors for one year, John F. Eagan, Atlanta, Ga., and Robert W. Bruere, director Bureau of Industrial Research, New York.

The following committee was appointed to nominate officers for the next year: J. M. Bruce, general sales director Remington Typewriter Co., New York; H. P. Kendall, manufacturer and banker, Boston; William H. Eaton, Eaton Crane & Pike Co., Pittsfield, Mass.; A. Merriam Cook, commander naval training camp, Detroit; and Richmond Mayo-Smith, Plimpton Press, Norwood, Mass. Two additional committees were appointed, one to study "unemployment within employment" with the idea of reducing it to a minimum; the other to provide for the introduction of courses in scientific management in the curricula of the nation's universities. The following were appointed to the first committee: John M. Bruce, general sales director Remington Typewriter Co., New York; Carl G. Barth, consulting engineer in management, Buffalo; S. E. Thompson, Thompson & Lichtner Co., consulting engineer in management, Boston; H. W. Shelton, consulting engineer in management, Philadelphia; R. Mayo-Smith, Plimpton Press, Norwood, Mass., and Ray M. Hudson, Holt Mfg. Co., Peoria, Ill. Upon the second committee were placed: H. H. Farquhar, Graduate School of Business Administration, Harvard University; J. A. Bursley, professor of mechanical engineering, University of Michigan; Joseph H. Willits, professor of industry, Wharton School, University of Pennsylvania; T. W. Mitchell, production engineer and labor manager with the Clothing Manufacturers' Industrial Exchange, New York, and N. G. Burleigh, Tuck School, Dartmouth College.

The Research Committee

The research committee of the society said that it needed about 150 industrial establishments to co-operate with it in studying the problem of unemployment within employment by keeping careful records and changing its methods of record-keeping as often as the research justified it. Announcement was made of the next meetings, the one in February to be held in Cleveland, and the one in May at New Haven, Conn. There was some discussion as to whether meetings should be held three times a year, instead of four times as at present. The present plan had many exponents who called attention to the importance of the work of the society in this time of reconstruction. It was suggested that local sections of the Taylor Society be permitted, one member claiming the time to be ripe for the formation of a New York section.

At the business meeting, three persons from other countries spoke: Miss Margaret Bonfield, Parliamentary Commissioner on Trades in Great Britain; Miss Kerstin Hesselgren, factory inspector, Stockholm, Sweden; and Charles de Freminville, consulting engineer Creusot Works, France. Miss Bonfield pleaded eloquently for the revision in the status of the workingman so that he would become a partner in industry. She said manufacturers held a mechanical attitude toward production and neglected the human side. Industry should be the servant, not the master, of the workingman, she said. Monsieur de Freminville told of the constant dread of unemployment on the part of the laborer and said that it was the duty of the employer to constantly plan ahead to prevent unemployment.

Low Labor Costs, High Wages

The first speaker of the last day was H. K. Hathaway, consulting engineer in management, Philadelphia, on "Standards: Their Nature, Purpose, Necessity." He said that lower labor costs make higher wages possible and the former are brought about by such methods as continuous straight line handling, elimination of waste motions, new machinery, improvement in records, reorganization of sales, improvement in stock-keeping. There should be standards of equipment, materials, methods, accomplishment and products. The Taylor system started to set piece rates upon an equitable basis.

The speaker told of concrete methods of effecting economy—of the installation of an automatic tool-grinding machine in a machine shop to eliminate hand grinding of individual workmen; of the standardization of tools and their abundance and accessibility; of the necessity of attention to belts running machinery in order that they may be at the efficient degree of tension, quality and working order, the speaker describing faulty belts as "one of the biggest causes of irregular production"; of the need to analyze the speed of machines, systematize their running conditions, and keep them oiled. He said: "It is not strange that the Taylor system should have been ignored several years ago, but it is strange it should be ignored now. Establishment of standards and their maintenance is the Taylor system, yet the standards must ever be revised.

The engineer must be steadfast in spite of the first failures of his system and must be careful not to establish a mongrel system by dropping some features to place in others not scientific."

Some Faulty Methods

The speaker gave some illustrations of faulty methods which have come under his observation—of the use of the same size of shovels in a steel plant, whether for shoveling heavy ore or lighter ashes; of the lack of uniformity of bolts, nuts, and accessories about machine tools; of the lack of system in furnishing a workman with tools, compelling him to furnish ones which the plant should furnish, and vice versa; of the 10 per cent variation of speeds of shafts; of the harm done to women workers because of the vibration of the floor, with the remedy brought about by placing their chairs on springs; of the failures in castings of foundries because the conditions which brought about previous failures were not recorded to provide against repetition.

"There are two ways of promoting the Taylor idea: by bringing out something new, or by keeping alive and spreading the known principles," he said. "The task of the nation now is to produce two things where one was made before. It is not enough for the laboring man to get busy and 'buck up' harder, but the manager has the major responsibility."

W. H. Leffingwell, president Leffingwell-Ream Co., New York, in the discussion said that the same principles which Mr. Hathaway had expounded for the machine and manufacturing shop applied equally well to clerical work. Gustav E. Schulz, formerly chief of supply division, Ordnance Department, told how the Taylor system could be applied for the benefit of purchasing agents by providing a standard nomenclature for the many parts in a complex machine or other article.

The Foremen's Attitude

Sanford E. Thompson, Thompson & Lichtner Co., Boston, spoke on "The Foreman" as follows: "When I was assistant foreman we had a discussion as to whether a foreman could succeed without damning his men. Taylor pointed out the fallacy of this old method, showing the modern method is to assist his men, rather than to damn them. The mental attitude of the foreman must be changed from that of a czar to that of an instructor. After a foreman is past 40 it is hard to reconcile him to new methods and he thinks he is being stripped of his authority.

"A foreman must be shown that the results from improved methods will go to his credit. Foremen should be dealt with personally and not in groups. It is a good thing to solicit suggestions from foremen to make them feel more a part of the management. When a foreman refuses to be convinced of the effectiveness of a proposed scientific method, appeal must be made to someone higher up. The foreman is the connecting link between the mill and the office. He must lead in planning the shop routine and must anticipate delays."

In the discussion, Mr. Dennison suggested his way of dealing with foremen. He pictures before the foremen the analogy of the workmen to customers. Customers must be pleased to a reasonable extent, though they should not be "truckled to." Mr. Hathaway suggested a committee be appointed to study just what the training of a foreman should consist of.

Labor Turnover

The first paper of the afternoon session was entitled "A Labor Turnover Formula," and was presented by Carl G. Barth, consulting engineer in management, Buffalo. By complicated algebraic formulæ he presented the different ways of finding such a formula theoretically and concluded that under normal conditions the rate of leaving of the workman was the vital factor to be ascertained. He showed the many formulæ to prove the futility of trying to make a complicated problem of labor turnover. He exhibited his ingenious algebraic symbol, invented by himself, for labor turnover, which was made up of an "L" and a "T" and a circle, the latter representing the "turnover." Though the address was scientific and valuable, the assembly had difficulty in assimilating his statements because of the mathematical complexity.

Discussion was made by F. S. Crum, Prudential Life Insurance Co., who helped solve the turnover compilation of the Emergency Fleet Corporation. He took the replacements, irrespective of the increase or decrease of the working force, and divided by the number on the payroll to compute the turnover. He favored the payroll figures for number employed because the payroll is stable, definite, and is revised usually every two weeks. Prof. Sumner H. Schlichter of the University of Wisconsin said he considered it just as important in computing turnover to regard separations of workmen from the company as replacements of those separated workmen, since the separations had to be replaced sooner or later, and if they weren't replaced the jobs were extinguished, which was just as harmful to the industry as the necessity of replacements.

Henry W. Shelton, consulting engineer in management, Philadelphia, spoke on "Mutual Rating: A Contribution to the Technique of Participation." He told of the novel scheme instituted by himself in the Emergency Fleet Corporation whereby all employees periodically rated in percentages their fellow employees, whether equals, superiors, or subordinates, in personality, ability and industry by the Australian ballot. He described these as ratings from the "inside-out," which he claimed were more effective than those from the "outside-in," such as experts called in would have given. These mutual ratings are inexpensive, self-corrective, stimulate employees to investigate and compile records and guide executives in making promotions, though the ballots were not taken as authoritative records of the worth of employees. In inaugurating such a system, the speaker advised that only a few human qualities be voted upon at first for the sake of simplicity and success; that wide publicity of result of the ballots be given. In conclusion, he remarked that "judgments by people are more democratic than judgments of people." Robert B. Wolf, consulting engineer, New York, described Mr. Shelton's contribution as the "first effort to evaluate the intangible." He said: "We must find ways to measure the mental and spiritual qualities of men."

Management of Mining Operations

Hugh Archbald, mining engineer, Scranton, Pa., talked on "The Need of Better Management in Mining Operation." He outlined the differences between the coal mining industry and other industries in which the Taylor system may be applied. The mining community is isolated and has its big problems of home-building, water supply, sanitation system, light and heat, etc. The movement of the cars and the digging of the coal are the two chief operations involved. Where all is darkness and extended over many miles, underground supervision is very difficult and accordingly the Taylor system has not yet been applied to coal mining. "Mining needs an industrial engineer the worst way," the speaker stated.

"The foremen are in absolute control underground, but they have too much to do. I covered in 16 hours the ground which an assistant foreman was supposed to cover in four hours each day. Three-quarters of the men are paid by piece rates. There is only a skeleton organization, the superintendents and foremen being the only ones employed regularly. The rest have to depend upon the seasonable demand for coal and on the supply of cars, which is often slight on the congested tracks."

Mr. Archbald told of the lack of communication in a mine and the by-word-of-mouth methods of transmitting orders through any messenger who happens to be available; of the shirking of responsibilities of foremen because of the ease of hiding in the mines, of the little effort to standardize methods, make time studies, of the gloomy attitude of miners because of the uncertainty of having work each day.

Thomas J. Read, Bureau of Mines, suggested that in mining the owner is working with a "wasting asset"—the ore or coal will give out and hence the stimulus for scientific management is wanting. Walter N. Polakov,

engineer, New York, said that the mine owners could inagurate economic methods, but it is more profitable to raise the price of the product instead. He deplored the lack of social responsibility of the mine owners. He attributed the present coal strikes to the mismanagement of the operators.

The Industrial Conference

"The National Industrial Conference of October, 1919," was discussed by both Mr. Dennison and Miss Ida M. Tarbell, investigator and author, who were delegates representing the public at this conference. Mr. Dennison stated that at first the chances of success of the conference were "very real." Academic opinions will probably characterize the second industrial conference. "Introducing the steel strike was the step next to the dissolution of the conference," he said. He thought that the illness of Mr. Gompers prevented the harmony that would otherwise have existed among the labor group, which harmony might have prevented the withdrawal of labor. The employers' group was represented by capital rather than management. The representatives were men having too little contact with labor and production. The legal phraseology in the employers' resolutions prevented clearness of issue. Labor had a little yielding tendency at first, but stiffened as it saw the employer group unyielding.

Mr. Dennison said that there was a wide range of opinion in the labor group which was more hopeful than their financial stand would indicate. When it came to collective bargaining the employers insisted they would not deal with outsiders, and "in this I think they were mistaken," the speaker added. Mr. Dennison's points of view recognized: The essential necessity of efficiency in management, the importance of the development of the shop committee, the control of corporations, unemployment and resulting economic difficulties, and collective bargaining. One present trouble is the inequality of the bargaining power. An employee in a plant of 1000 workmen is putting everything he has at stake when he bargains on wages, hours, etc. The employer has only one-thousandth at stake. Bargaining should be regulated so that the "stakes" are equal. "There are two ways to organize employees: Trade formation and shop formation. Both will prove essential to sound social structure. In the case of the shop organization it will be too easy for the employer. The trades union has a defense of the workmen's interests, but loses the opportunity for co-operation and partnership which the shop organization has. Both forms are the warp and woof of the labor structure. One will form a check upon the other. A workman does not have any true choice of his representative when any limit or qualifications are put upon that representative. The employer has not the right to prejudge the man who comes to represent his employees. The ignorance on the subject of industrial relations warrants a dozen more industrial conferences at Washington."

Miss Tarbell's Views

Miss Tarbell said that the public group was not cohesive in contrast to the other groups. She said: "I felt we should have had a classification of terms and definitions. There was no mention made of management. Both labor and capital agreed that wages should be based on occupation, not sex. Several were primed with schemes of profit-sharing. The eight-hour day would have been combated as not flexible to all industries. The employers would make the week, rather than the day, the unit of working time. Strangely, labor had little to say about conditions of work, but the employers decreed that conditions should be 'as safe as the business would permit.' The British anti-profiteering bill was advocated and social insurance covering every evil which might befall the workman was proposed. Arbitration and conciliation were brought up early in the hopes of heading off the steel strike. It was proposed that a National Conference Board should be appointed to deal with all labor disputes."

In the discussion Mr. Bruere asked why the Taylor Society and scientific management were not represented at the conference and asked why the public was not organized. He said: "Heretofore managers have not been free men, but have been linked up to one of the two parties. They should be public servants and should act as servants to both labor and capital." Mr. Mixter, a member of the Taylor Society, stated that he had investigated the conference thoroughly and felt that the attitude of employers was that real collective bargaining implies unionism; that the employers themselves are not ready to organize, as would be necessary for collective bargaining; that the employers wish to go back to the old nineteenth century competition; that they believe that England was being ruined by unionism, though they neglect to recognize the success of Great Britain's cotton industry, where unions are strong. In short, the employers are ignorant as to true conditions.

T. W. Mitchell, of New York's clothing industry, said that in his industry the real problem was to educate both sides for a proper sense of responsibility as to contracts. Mr. Polakov said that the conference dealt with opinions and not facts and that people with mere opinions were bound to fail. Mr. Cook stated that public opinion is in favor of a fair form of collective bargaining and that any satisfactory group for bargaining must be on a national basis. The shop union will afford no ultimate relief—we must have a national organization of labor. Evans Gregg, St. Louis, said that scientific management has not sold itself to industry; that "it has gone wool-gathering." Strenuous exception to this statement was taken by John H. Williams, consulting engineer, New York, who said that all new organizations had difficulties in finding themselves.

Coke Workers Wages Advanced 14 Per Cent

Effective from Dec. 1, practically all the coke operators in the Connellsville and adjacent regions granted their coal miners and coke workers an average advance of 14 per cent in wages, this being the same amount granted by the Fuel Administration to the striking coal miners. This is the largest single advance in wages ever made in the history of the Connellsville coke region, previous advances having ranged from 5 to 10 per cent. Notices of this advance have been posted at the coal mines and coke works of the H. C. Frick Coke Co., the Orient Coke Co., Washington Coal & Coke Co., W. J. Rainey, Consolidated-Connellsville Coke Co., Puritan Coke Co. and other producers.

Under the terms of this new wage scale, now in effect, wages of coal miners and coke workers will be much the highest ever known in the history of the coke trade.

Representative Plan Continued

The Standard Steel Car Co., Hammond, Ind., at whose plant a strike of employees was recently ended, states that it is not true as reported that the plan of representation adopted by the company's employees before the strike has been abandoned. The company expresss the opinion that the plan is now of more value than ever because the men realize that through an orderly handling of matters of mutual interest more good can be accomplished by contact of employer and employee than through the aid of outsiders. The company does not recognize craft committees, but the plan of representation functions through individuals in the several departments. The men returned on exactly the same terms under which they struck.

New Second-Hand Machinery Company

The Delta Equipment Co. has been organized to deal in new and second-hand electrical and steam equipment, boilers and machine tools with offices, wareroom and shop at 140 North Third Street, Philadelphia. P. J. McBride, formerly of the steam and electrical department of Frank Toomey, Inc., and George B. McClennen, who was with the machine tool department of the Toomey company, have with Andrew I. Mehan purchased the Delta Electric Engineering Co., in which Mr. Mehan was interested. In addition to buying and selling equipment the company will repair electric motors and generators, this having been the business of the Delta Electric Engineering Co.

Turret Lathe with Double Friction Back Gears

A turret lathe with double friction back gears is announced by the Warner & Swasey Co., Cleveland. This is known as the No. 6 turret lathe and is equipped with or without automatic chuck, bar feed and power feed to turret. Either a standard or heavy duty carriage is furnished with the machine.

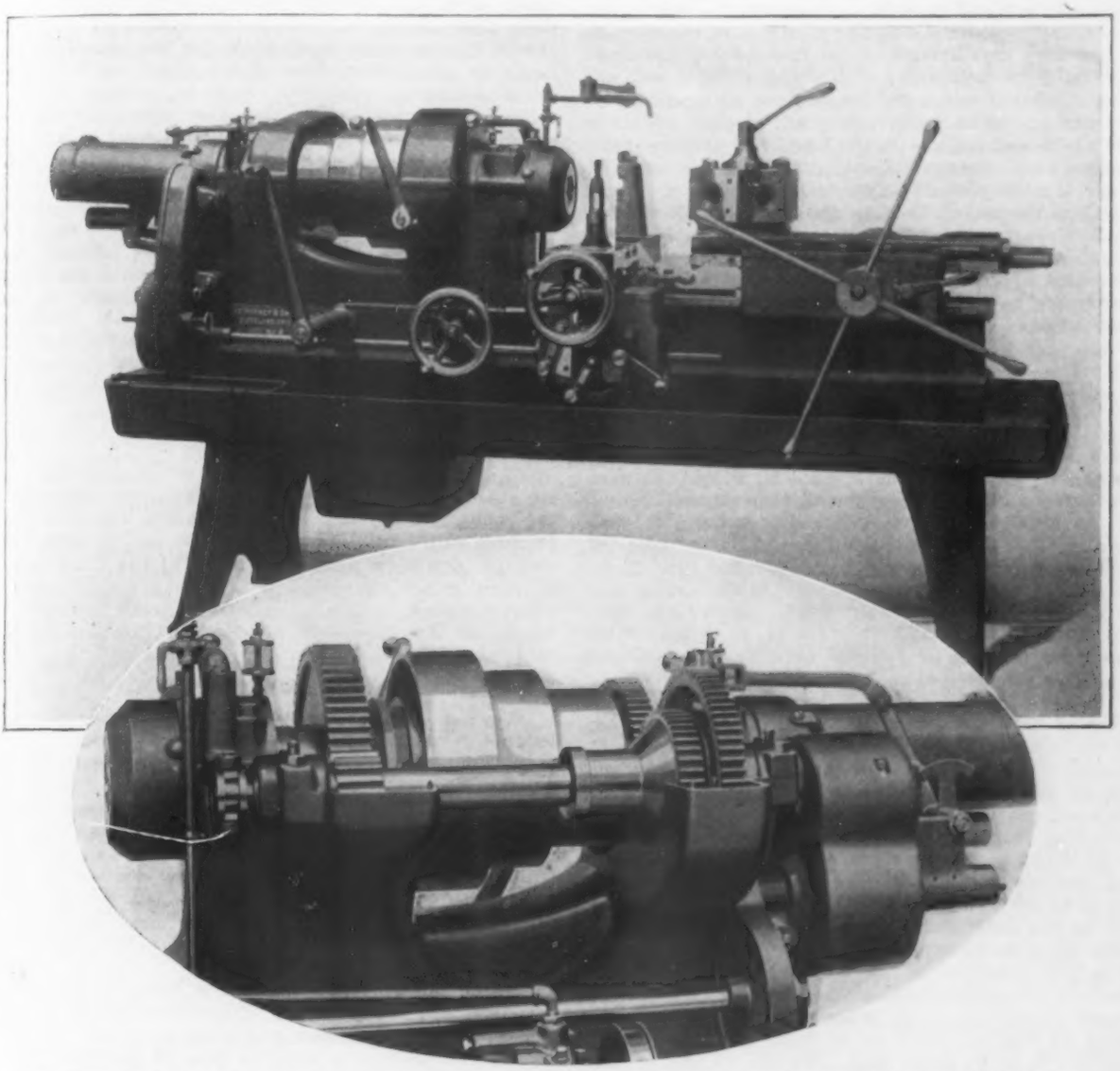
The double friction back gears are explained as increasing the productive ability over the single geared machine by almost doubling the power and giving a greater speed range. With this construction nine spindle speeds are available, three for each step of the driving cone.

The heavy duty carriage has power or hand operated cross feeds and hand longitudinal feeds. Six power cross feeds and reverse are obtainable in the apron; the three finer feeds for forming and the three coarser for facing. The cross slide is fitted with a dial graduated to 0.002 in., and adjustable stops are provided for either direction. The front tool post is round, has an adjustable wedge and is arranged to be swiveled at any angle. A cutting off tool holder is regularly furnished for the rear. Either of these tool holders may be removed and forming tool holders, necking tool blocks or other tool holders substituted. This heavy duty carriage is explained as being especially adapted for gear blanks, forgings and tough alloy steels requiring heavy forming and facing cuts.

The standard carriage is of the company's regular type and has hand longitudinal and cross feeds with adjustable stops for the cross slide. The tool post and tool holder are similar to those furnished with the heavy duty carriage.

The automatic chuck and bar feed are operated by a long lever in front of the head. A stepped wedge automatically adjusts the collet for slightly varying diameters. A master collet and bushing pads are regularly furnished for holding 2¼-in. round stock. Bushings for hexagon stock can be held in this collet also. Square stock requires a square stock master collet and bushing pads.

The hexagon turret is arranged for holding tools with or without shanks. The six tool holes, counterbored for centering plate tools, are fitted with draw bolts and are regularly bored 1¾ in. in diameter. Bolt holes are provided for securing plate tools to the faces. The turret is revolved automatically by the backward movement of the slide. Independent adjustable stops operate automatically for each position of the turret and disengage the power feeds. Power feed for the turret slide can be furnished when desired.



Double Friction Back Gears on This Turret Lathe Are Explained as Increasing the Production Ability Over the Single Geared Machine by Almost Doubling the Power and Giving a Greater Speed Range

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The American Zinc Products Co., owned by Youngstown and Niles, O., interests, has installed a complete line of zinc roofing machinery in its rolling plant at Greencastle, Ind., Secretary C. H. Stewart announces. The company is prepared to promptly fill orders for flat sheets of all thicknesses and sizes, zinc ridge rolls and for all sizes and forms of corrugated and V-crimped zinc sheets. The company has been engaged for several years in the slab and sheet zinc business.

Industrial Conditions in Europe

Speakers Before Export Association Discuss Domestic and Foreign Economic Situation —Exchange Obstacle Must Be Overcome

FOREIGN exchange, the high cost of living and the industrial regeneration of Europe were discussed in addresses at a luncheon held by the American Manufacturers' Export Association at Hotel La Salle, Chicago, on Dec. 4. W. L. Saunders, chairman of the board, Ingersoll-Rand Co., and president of the association, denied that living costs in this country had risen materially in comparison with average wages and salaries. Inflated values are concomitant with prosperity, and are not to be found in poverty-stricken countries like China and India. On the subject of foreign trade, he said that long credits are essential to our winning a substantial volume of exports. B. S. Cutler, former director, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, spoke in a like vein regarding the relation of credits to exports. He also presented a detailed survey of industrial conditions in Europe as he found them on a five-month tour of investigation.

State of Profound Evolution

Mr. Cutler's address is abstracted below:

"In the United Kingdom labor is in a state of profound evolution, or I might better say that the relations between labor and industry itself are being revolutionized. Although the dispute is, indeed, between the persons of the employer and the laborer, the nub of the dispute is not as to whether either side shall be abolished, as in Russia. There is no struggle for supremacy on the one hand and for the survival on the other. For the English laborer is demanding now only what he unmistakably wanted before the war. For many years he had been organized to obtain certain privileges as soon as political or economic conditions should give him the power to demand them.

"I asked the permanent Minister of Labor in what order of importance he would place the labor demands as formulated: *Higher wages, housing improvements, shorter hours, dictation of shop rules and physical conditions, and joint control in general management.* He answered me immediately that 'joint control of manufacturing properties' was the paramount issue. There is no doubt about the truth of this declaration when one realizes that the English workman considers his job to be his own personal property. More times than not he has inherited the job from his father or from some other male member of the family, and he prefers it to any promotion of the ordinary grade. For generations his daily subsistence has been dependent upon wages earned in those factories. There is no such thing as floating labor as we have it in the United States. It is no great step, then, to the theory that labor should be joint master in the house which labor thinks it has built and occupied.

Shop Conditions Bad

"No one denies the necessity of better housing and better shop conditions, from the standpoint of sanitation. In many manufacturing properties they are the extreme opposite of what we factory owners call decent. Lack of daylight, lack of fresh air, lack of water-piping and lack of heat have been prevalent; and it will take much time and expense before the responsible owners can make improvements according to new standards adopted during the war.

Obstacles in Way of Expansion

"The very handicaps which stand in the way of rapid sanitary reform also operate against reform of mechanical process and equipment. Most of the plants are built compactly in the hearts of cities where expansion is too costly and often impossible when a stubborn land-owner of adjacent property refuses to do business.

"Operators also fear that using old working space for new elevator shafts, in place of narrow, creaking stairways, and using space for light and air shafts, will cut down production at the very time they need it most. They are now much more concerned in crowding their floor space with productive machinery of the newest type so as to compensate for the loss of man-hours by the inauguration of the 48-hr. week.

"The loss of a 55½-hr. week is a more serious thing in England than in any other country, because she always met international competition by means of lower wages and longer working hours. To-day there is a universal demand for modern machinery and quicker mechanical processes to compensate. In some of the textile trades, English invention of new machinery is admirable; other trades are still afflicted by a reluctance to throw aside any out-of-date machine, if it still runs, and to substitute one of greater speed or accuracy. Conservation is still the main instinct, even in respect to different and difficult levels of shop flooring, for instance, over which workmen constantly stumble along with heavy castings or over which truckers bump their truck loads of lumber, etc.

No Stimulus for Inventive Genius

"Another handicap to mechanical improvement is an absence of encouragement to inventive genius in the shops. If a young mechanic should approach his foreman with a new idea, he would be told to mind his own job and keep production down to the dead level of hand labor. Suppression of mechanical freedom, also, conforms to the policy of restricted production which the English labor unionist has adopted as a cardinal principle.

English Wages

"On the matter of wages little that is definite can be said in detail because actual wages paid are not often divulged and moreover the minimum scales promulgated by the Government are frequently altered to fit conditions already passed. Although it has been the aim of the Government, under the defense of the realm act, to establish by decree wages that accord with the increased cost of living, they are subject to several distracting considerations, such as a fair margin for comforts, the reduction of working hours, the proper advance over unemployment pensions, and the substitution of female for male labor.

"As to the pension system, it is worthy enough in principle, but everybody in England knows, now if not before, that few men will work hard for a wage of, say, 45 shillings a week so long as they can loaf at 35 shillings.

"There is not so much substitute female labor surviving the war as one might suppose. Even where employers desired to retain women and the women themselves wanted to stay, the irate British workman ordered his womenfolk back to their homes. The return meant another industrial derangement, as 526,000 women had entered shops during the war and about 250,000 had taken men's places.

"I submit only two wage scales ordered by the Government, since these are enough to indicate advances in trades respectively female and male.

"Milliners and skirt-makers, a woman's industry, received the following average wages in pre-war, war and after-war years:

1906—12s. 6d. to 14s. 3d. a week, or $0.05 an hour.
1914—15s. to 20s. a week, or $0.07 an hour.
1916—21s. to 30s. a week, or $0.10 an hour.
(With meals gratis in munition plants.)
1919—A rate of 14 American cents an hour, minimum, as decreed by the Ministry of Labor April 7; in practice 15½c. is being generally paid; both rates based on a 48-hr. week.

"In the iron industry the following scale was opera-

tive in August, 1919. These wages are based on a 47-hr. week, and subject to a 12½ per cent bonus:

Town	Iron Molders *Shillings*	Smiths *Shillings*	Pattern Makers *Shillings*
Leeds	70½	66½	69½
Sheffield	72½	70½	72½
Glasgow	72½	70½	69¾

Average hourly rate for iron molders, 37 U. S. A. cents.
Average hourly rate for smiths, 35½ U. S. A. cents.
Average hourly rate for pattern makers, 36 U. S. A. cents.

"These figures represent an advance of about 50 per cent over 1914.

The Outcome of English Labor Crisis

"What now will be the outcome of this melange of disabilities and unreasonable demands on industry? Many people look upon the English labor situation as hopeless, especially when they view the anaemic physical condition of the average factory worker, when they listen to his preposterous scheme of economic aggrandizement, and then they see him lazing on the door step with his family drinking beer and oblivious to his own desperate needs and the needs of his country for work, work, and yet more work. On the contrary, I am confident of his regeneration—in time. He and his employer—call the latter capitalist, if you will—are together working out a new industrial relationship, a new type of joint responsibility as between men of the same race, the same nature, the same thousand years of history.

Labor in France

"The quality of labor in France is just what it has always been, thoroughly efficient in liberal arts that represent French character and taste. It is greatly reduced in quantity by the ravages of war. In general, the standard trades are eager to get working again. They hope to do more than formerly in the heavy industries, such as steel, clay products, building materials, etc. From the standpoint of governmental economy they have not much time to lose, since the retention of 2,000,000 men under colors is a severe strain on current finances. The supply of steel is in French hands, now that Alsace-Lorraine belongs to them. Shortage of coking coals for their furnaces can be remedied in time if enough pig iron is traded to Germans for coal.

"That the French are willing to work hard at what they like is shown by the last agricultural survey; crops this fall increased 60 per cent over those of 1918. Whether or not their labor is equal to a production of 10,000,000 tons of steel annually is uncertain, for that will require a tremendous excess of engineering experience and engineering inclination. If there is a paramount defect in French economic life to-day it is the overabundance of traders and negotiators. It takes ten men to dispose of one man's product. The polite callings are over-populated, and the overhead cost gets out of hand. As for the French trade unions, they appear to be more of a political phenomenon than may be dealt with in this article.

German Workman Industrious

"When one views the German workman at close range one finds a sturdy, somewhat stolid human whose prime instinct is to work. He is equal physically to the strain of heavy work, and long work, because he is never distracted by a sensitive nervous system. He wants nothing so much as steady employment and a calm home where he may rule and be ruled. The belief instilled in him by a military aristocracy that he could be a world conqueror has completely fled—although I can not say he would refuse to fight if oppression from foreign quarters goes beyond his endurance. It follows also that a period of hunger and exposure too prolonged might stir him into domestic revolt, unless abundant military forces were at hand.

"At present he and his family are in severe straits because his wages have not risen in proportion to living costs. Sixteen marks a day for locomotive engineers will not buy lard at 26 marks the kilogram; nor will it buy many potatoes after rent and clothing are figured. Except sugar, he has nothing in the way of a heat food. He is big, but is becoming anaemic—and anaemics of his mental make-up are incalculable. As a rule all anaemics are dangerous. Of what is he capable at this time? Many competent judges are convinced that he can and will perform swiftly and adequately the heavy labor of rebuilding Continental Europe if he has the materials to work with.

"The loss of 2,000,000 men by death and the disablement of 1,500,000 more during the war have not, in the estimation of German industrial leaders, curtailed the ranks of technical labor. It may be said that trade unionism has not claimed the allegiance of German labor in preference to loyalty for the fatherland. Patriotism is still uppermost, and all they ask is a chance to pull their country and its people out of the slough of despond by hard work, 60 hours a week, if necessary.

Physical Condition of European Plants

"The physical conditions of manufacturing properties in Europe present every degree of modern efficiency and complete destruction. In a general way, it may be said English and German plants remain nearer what they were before the war. The English have learned much about the value of modern processes, and are now on a par with the Germans in preferring new scientific production. Their ideas of what scientific shop practice should be, in order to compete with the United States, run far ahead of any reform in factory equipment which they can install for years to come. In fact, both English and Germans are inclined to exaggerate our use of rigid system because we talk it and write it so much. They fail to see that our mechanical methods have grown only as fast as our workmen could absorb them; they were not imposed over night on rebellious factory forces.

European Transportation Inadequate

"On the continent, railway transportation is a common industrial property that needs complete regeneration before there can be substantial improvement in production. Necessary abuse of roadbeds and rolling stock during the war left some systems in a state of chaos. However slow transportation may have become, there would still be a relief to freight congestion, if sufficient motive power were available. The opposite condition exists. Not enough able locomotives can be found to move merely the coal that Continental Europe wants so badly. The main difficulty is not so much a lack of locomotives—there appears to be plenty for immediate needs—as the state of disrepair in which they stand. Nor is labor absent from the repair shops. What they cannot do without are certain materials which the American high commissioner of the Inter-Allied Rhineland Commission named to me as follows: Copper, hard steel, bronze, graphite, asbestos, and, above all, serviceable lubricating oils. The use of makeshift materials has resulted in the constant return or abandonment of locomotives only two weeks after being repaired.

"When I went to our Rhineland commissioner with a plan to form an engineering corporation of international character for railways repairing on a large scale, which I think would prove a profitable enterprise either for the governments party thereto or for private investment, I was told that already discussion had taken place on a plan of centering international repair shops in Belgium, but jealousies and enmity between governments were still too active for voluntary co-operation.

"Until there is governmental joint action in the establishment of a repair program for railways, there will not be a wise use of such raw materials and finished products as are immediately available from local resources. To this end a corporation composed in part of American capital and American engineers would likely prove the most practical, assuming that the combination were welcome to the several governments which own the overlapping systems.

Raw Materials and Credit

"The question of sufficient raw materials to keep industry going at a rate adequate to the minimum of

current needs brings one face to face with the problem of credits. Individual banks and groups of banks located in the several smaller countries to the north of Europe have tried to answer requirements by the employment of barter in raw materials for finished products; that is, they are trading bales of cotton and other fibers for equal value in textiles to be returned at a future date carefully specified. In such cases the values on both sides of the bargain are expressed in guilders or kronen, or perhaps pounds sterling. When wool is thus delivered in return for definite amounts of woolen cloth, or lumber in return for furniture, let us say, a contract is negotiated whereby acceptable securities pass into the hands of the loaning banks; these securities frequently consist of controlling stock in the industries so favored. There are plans on foot for the consummation of this style of barter on a much larger scale than has heretofore taken place. And yet I can not believe that the method will satisfy the industrial needs of France, Germany and countries further east in a degree that will solve the European problem of how to revive industry. The amounts implied are altogether too small and the process is a slow one of waiting for finished goods before further consignments of raw materials are handed over.

A Ton of American Coal, 1000 Marks

"Further difficulty in securing what is needed for production is found in the prohibitive cost of materials which originate in creditor countries, where currencies have a value tremendously out of proportion to the value of currency in debtor countries. A ton of American steam coal delivered at Hamburg is quoted at $30, a figure composed of $10 for the coal at pit's mouth and $20 for transportation. In addition to the excessive overhead of transportation, there is also the cost of converting dollars into marks, so that we have, at an exchange rate of 3 cents per mark, a total c.i.f. value of 1000 marks per ton, as compared with the pre-war price of about 400 marks.

No Early Appreciation of European Currency

"Neither is it thought by financial authorities who have carefully appraised the value of continental currencies that their present low value may be rectified by arbitrary arrangement. The value of a note issue depends upon a combination of several factors, any one of which may have a decisive influence toward depreciation. Roughly, these may be called: The amount of issue, the gold reserve on which it rests, or substitute securities, the domestic and foreign debts of the government making the issue, and the stability of the Government which has assumed obligation to redeem the issue in accordance with the promise on its face. It seems to most of those who have studied the matter that European currencies will require a long time for rejuvenation to the point of normal value in the estimation of other countries.

"While these currencies are still doing valiant service as mediums of exchange in their own countries, they fail sadly when called upon to pay for foreign raw materials.

Credits Will Break Exchange Deadlock

"On the other hand, the creditor countries can not expect to sell their own goods to the debtor European countries unless the latter can produce their own habitual goods for purpose of exchange, and European goods will not be forthcoming until materials are supplied from the creditor countries. There is here presented a deadlock which can only be broken by credits, credits chiefly from the New World and from Great Britain, which empire controls a large part of the industrial necessities essential to the basic industries of the world. We conclude, therefore, that the United States can do no business of consequence for a while in Europe unless it extends vast credits for food and materials, or else descends into the method of piecemeal barter. There are a number of far-seeing American financiers who advocate such credits from the United States only on condition that Great Britain and other interested creditor countries participate in the loans.

"Viewing all aspects of the European economic situation, the observer with a historical perspective will conclude that recovery is certain in the course of time since the instinct of self-preservation residing in several hundreds of millions of people will suggest to them methods appropriate to their needs. But he will also reflect that too long a postponement of economic reconstruction may bring about periods of demoralization which only the most self-possessed peoples can outlast. There is no doubt in my mind that adequate aid may be rendered without in the least impairing our efficiency in the further development of our own beloved country."

William A. Thomas Retires as President of Brier Hill Steel Co.

William A. Thomas, president of the Brier Hill Steel Co. since its formation, Jan. 27, 1912, has resigned, effective Jan. 29, the date of the company's annual meeting, and will retire from active business. The company issued the following statement:

Mr. Thomas was, for a number of years previous to the formation of the Brier Hill Steel Co., energetically engaged in the management of the Thomas Steel Works, and at the time of the formation of the Brier Hill Steel Co. was elected first president and has occupied that position since 1912.

During the years intervening since his election as president of the Brier Hill Steel Co., the company developed its property by the addition of a large steel plant, the building of 12 open-hearth furnaces, the construction of two large plate mills, the erection of an additional blast furnace and ore yards, together with modern equipment to operate the same, and the building of a battery of 84 by-product coke ovens, a benzol plant, and numerous other facilities to round out the property of the company.

Mr. Thomas feels that on account of the laborious work which has fallen to his lot as president of the company in planning and carrying out these improvements, and the strain incident to operating the plant and carrying on a portion of this work during the period of the war, he is entitled to be relieved from the anxiety and activities which would naturally fall upon him if he continued in the position of president of the company. He feels that he has earned a much-needed rest and that he is entitled to enjoy the comfort and peace of a less active business life.

In making his announcement at this time to the board of directors of his wish to retire, it will afford the board ample time to arrange for his successor at or before the next annual meeting which takes place Jan. 27, 1920.

The Brier Hill Steel Co. is a consolidation of the Brier Hill Iron & Coal Co. and the Youngstown Steel Co., both of Youngstown, Ohio, and the Empire Iron & Steel Co. and the Thomas Steel Co., both of Niles, Ohio. The Brier Hill company later acquired the Western Reserve Steel Co., Warren, Ohio, now operated as the Western Reserve works. The company has 28 sheet mills, 84-in. and 132-in. plate mills, and is fully self-contained in ore and coal.

Mr. Thomas was born June 8, 1865, in Wales. When the American Sheet Steel Co. was formed, he organized the Niles Iron & Steel Co., at Niles, Ohio, with a capital of $100,000. After operating under this name for about four years, Mr. Thomas and his brothers purchased the holdings of other partners and reorganized the company and increased the capital stock of $500,000, giving the reorganized company the name of the Thomas Steel Co.

Movement is under way in Youngstown, Ohio, to establish an industrial relations board to promote better feeling between employer and employee. Manufacturers and labor leaders have been approached and both parties have signified a willingness to co-operate in any way that will lessen industrial discord, induce harmony and reduce labor unrest.

George W. Prentiss & Co., proprietors of the Prentiss Wire Mills, Holyoke, Mass., are erecting an addition to their plant to be three stories and to cost about $50,000. The extensions will be used in part for additions to the heat treating department and for the storage of material.

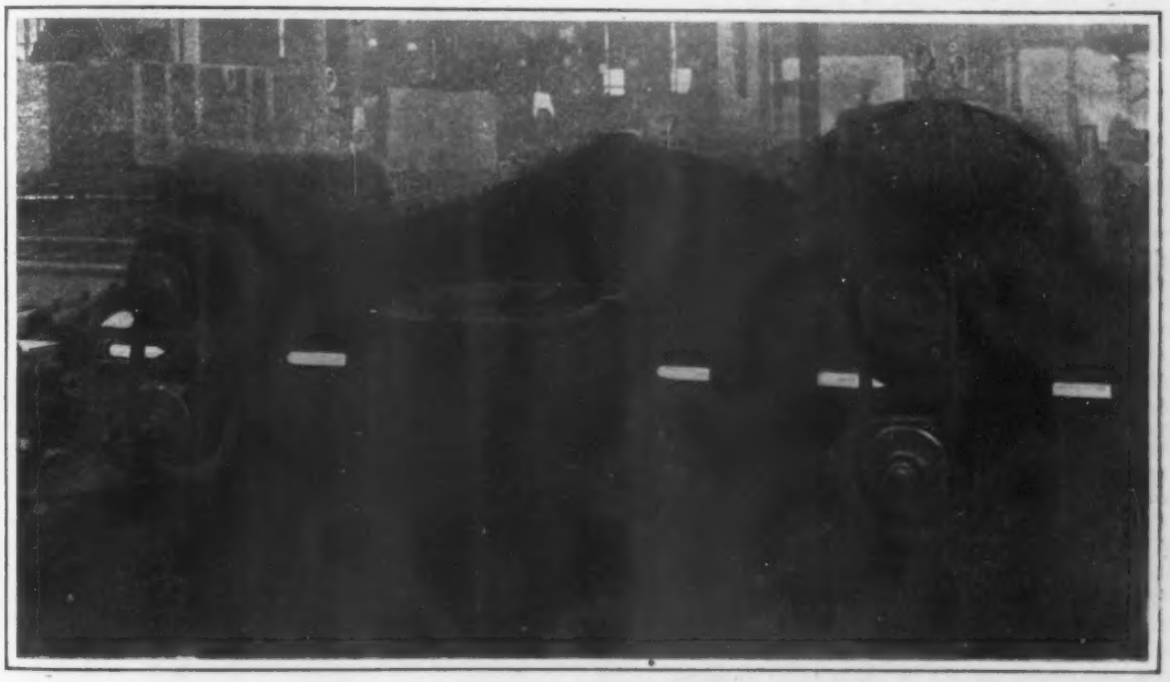
New Process Removes Scale from Butt-Weld Pipe

A process for removing welding scale from butt-weld pipe is announced by the National Tube Co., Frick Building, Pittsburgh. Pipe that has gone through this process is said to possess only the desirable thin, tightly adhering film of blue oxide which gives a certain amount of protection to the pipe without possessing the disadvantage of heavy welding-scale. The process is entirely mechanical in operation and it is announced that the cost of production is not increased thereby to an appreciable extent. Up to the time the skelp enters the furnace, where it is heated for welding into pipe, the operations are identical with those used in the past for the company's regular butt-weld pipe.

When the skelp has reached the proper temperature for welding, it is drawn through the customary type of welding bell forming an unfinished tube. The tube then passes through a set of rolls, where it is reduced slightly in size and elongated. In this operation, the welding scale which has formed is partially loosened by the working of the rolls, but further special treatment is necessary to secure the desired result. From the sizing rolls the pipe is conveyed to a cooling table across which it travels to the scaling rolls.

It is the nature of the welding-scale to harden somewhat more quickly than the pipe metal, and while the pipe is still soft and hot and the scale is in a hardened and brittle condition it is given a pass through a series of rolls of special design, shown in the accompanying illustration. These rolls reduce the size of the pipe somewhat, crush the pipe down slightly and roll the pipe to its correct finished size. The reduction in the size of the pipe cracks the hardened welding-scale from both the interior and exterior surfaces of the pipe, leaving them clean and smooth.

From these scaling rolls, the pipe moves to another cooling table, where it is kept slowly rolling as it travels across, straightening somewhat as it cools. After a pass through a set of cross rolls, to take care of any straightening that may remain to be done and to give the exterior a smooth, clean finish, the pipe is taken to a tank of water where it is dipped, tilted to a slanting position and the water allowed to rush out, carrying with it the loose scale from the pipe. Certain sizes have the loose scale blown out by a blast of compressed air instead of being dipped in the water. The pipe is then trimmed, threaded and tested in the usual manner of all butt-weld pipe.



The Pipe Passes Through This Series of Rolls Where It Is Reduced Slightly in Size. This loosens the hardened welding scale and it drops from the pipe walls.

Calorene Gas Has High Cutting Quality

A new cutting gas, calorene, developed from the manufacture of alcohol, was described by Prof. Alfred S. Kinsey, Stevens Institute of Technology, Hoboken, N. J., before the recent convention of the American Foundrymen's Association, Philadelphia. Calorene was described as an unsaturated gas, its analysis showing carbon, 86 per cent; hydrogen, 14 per cent, and a heating value of 1580 B.t.u. per cu. ft.

Acetylene has the highest ratio of carbon to hydrogen, with the new gas next in order. This largely accounts for the fine cutting qualities of these two gases, but the unsaturated nature of the gas producing a high rate of combustion also enters, and in this regard the new gas has so far been shown to be practically the equal of acetylene as a cutting gas. Acetylene gives a maximum temperature of 6300 deg. Fahr., whereas calorene gives 6200 deg. Fahr. From tests conducted Mr. Kinsey concluded that while the consumption of oxygen per cubic foot increases with the thickness of the metal being cut, both the labor and consumption of the new gas decreases. This results in maintaining a low figure for the total cost per square inch of metal cut.

Under certain conditions some cutting gases will leave the surface on each side of the kerf, or slot, of a job covered with an oxide scale so hard that it is impossible to machine the surfaces, and even grinding is inefficient. The metal under the scale is also sometimes liable to granulation and brittlizing due to the action of the flame. The kerf scale of the new gas is about 0.008 in. thick on a 4-in. cut and always is noticeably thin and fragile, and the under surface is undisturbed in hardness as determined by the scleroscope and file.

Calorene may be compressed to 3500 lb. per sq. in. and stored as a free gas, no filler being required in the cylinders. This partly accounts for the lightness of a commercial cylinder of the gas; a full cylinder containing 210 cu. ft. weighs 85 lb., which compares with 250 lb. for acetylene. It may be brought in contact with oil and grease without danger of explosion. It will work at low temperature and its point of combustion is about that of illuminating gas. It has a pleasant odor and its products of combustion are unnoticeable and harmless.

The United States Steel Corporation has given the city of Gary, Ind., 116 acres for park purposes.

GUNS AND ORDNANCE

Report on Progress at Plant of Government at Charleston, W. Va.

WASHINGTON, Dec. 11.—The annual report of the Bureau of Ordnance of the Navy Department states that important extensions have been made to the naval gun factory of the Bureau of Ordnance. The following new equipment has been installed: Three 300-ton cranes, one 40-ton crane, three 10-ton cranes, two electric gun-shrinking furnaces, two electric hoop furnaces, two 102-in. turning lathes, one 102-in. boring and turning lathe, one 60-in. boring and turning lathe, two 120-in. boring and turning lathes.

The extension to the steel foundry has been completed and is now occupied although not fully equipped.

The open-hearth furnace has been rebuilt to 20-ton capacity and has been operating in a most satisfactory manner. The use of the electric steel melting furnace has been further developed. This furnace has been found to be a most valuable adjunct to the gun factory's capacity for steel production. In the forge there were installed two car annealing furnaces, two forging furnaces, and two heat-treatment furnaces designed and constructed by the Naval Gun Factory. The new addition to the forge shop has been completed, machinery installed and in operation, including one new 7,500-lb. and one 5,000-lb drop hammer, two new trimming presses and two 15-ton traveling cranes.

The report also makes a preliminary statement concerning the work done at the Naval Ordnance plant at Charleston, W. Va. The installation of machine tools was pushed rapidly during July and August, 1918, and was practically completed by the end of November. The three electric steel furnaces, each of six tons capacity, were put in operation during June, July and August, and this department of the plant may be considered as being on a running basis from September, 1918. Similarly, in the forging shop, the 500-ton press was started on Oct. 2, and the 3.000-ton press on Oct. 15, 1918, and finally the heat-treatment department was put on an operating basis sufficiently satisfactory to meet the production of the forging and hot-metal department by August, 1918.

At the end of the fiscal year, the foundations of the open-hearth building and the open-hearth furnaces had been completed, while approximately 1000 tons of structural steel had been erected. Grading and excavations for the forge and furnace building were well under way; 1000 tons of structural steel had been erected for the machine shop, and the foundations for the heat-treatment plant were 50 per cent completed.

Refractory Cements

A refractory cement, in order to be universal in its application should air set and not depend upon heat for creating the bond, in order to form a union throughout the structure, according to W. S. Quigley, president Quigley Furnace Specialties Co., New York, who discussed the subject before the recent convention of the American Foundrymen's Association at Philadelphia. Further important qualities, he stated, should be: Fineness to pass a fine mesh sieve to avoid coarse particles tending to create voids between the brick which it is used to bind; non-shrinkage when subjected to heat; adaptability as a binder with crushed fire-brick, old crucibles, fire sand, fire clay, ganisters for making rammed-in linings, and either hot or cold repair work; a composition suitable for making neat, small, hot patches and repairs. Of these he emphasized the desirability of a co-efficient of expansion, as nearly uniform as possible, at various temperatures, as the principal essential. The range of expansion in different cements, he stated, varied at 2200 deg. Fahr. between 0.075 in. for fire-clay brick and 0.175 in. per ft. for silica brick. A cement with a co-efficient which lies between these two figures, he described as advantageous for use with either of these refractories.

Fire clay, he said, required a vitrifying heat for forming a bond. Such a heat that would penetrate through the entire thickness of the wall was impracticable and the common result therefore he termed a vitrified shell with a weak structural backing. The coarse grades of mixed materials or cements, depending upon heat or vitrification for a bond, are limited to use where this heat approximates the furnace temperature. Cements depending upon a fibrous structure, he stated, frequently shrink and eventually lose binding value, particularly as the temperature increases.

Relative Cutting Properties of Stellite and Cooperite

WASHINGTON, Dec. 1.—The U. S. Bureau of Standards has worked out an important series of tests on the relative cutting properties of Cooperite and Stellite. This was done at request of the Ordnance Bureau of the Navy Department. These two alloys, though quite different in chemical composition, have very similar mechanical properties, says the report. They are very hard and able to keep an edge at a rather high temperature. They are used, particularly stellite, quite extensively to replace and supplement high speed steel tools for cutting. Cooperite is essentially an alloy of nickel and zirconium with appreciable amounts of iron and silicon. Stellite, which is manufactured in several different grades, is a rather complex alloy, the essential elements of which are cobalt, chromium, tungsten and molybdenum. The series of service tests made showed that cooperite is but slightly inferior to the better grades of stellite. Lathe tools made of cooperite failed after a cut of 4-in. lengths made on a 5-in. round of nickel-chromium steel under the following conditions: speed, 226 ft. per min.; feed, 0.0135; depth of higher speed, 240 ft. per min., the other conditions being the same, but for a length of 8 in. before failure occurred.

Institute Teaches Oxy-Acetylene Welding

An institute for training men to use the oxy-acetylene torch for welding and cutting metals was established at the plant of the Davis-Bournonville Co., Jersey City, N. J., 1917. After the United States entered the war, the institute was devoted exclusively to the training of soldiers and sailors in the use of welding and cutting apparatus. It was released from Government control in the spring of 1919 and is now open to men who can qualify for the training required to make them not only skilled torch operators but welding and cutting experts having thorough knowledge of apparatus and principles.

The course of instruction requires three weeks attendance during which period the learner is trained in the welding of steel, cast iron, aluminum and bronze, and is given lectures on gases, combustion, flame, heat, welding, work preparation, expansion and contraction, preheating and many other subjects intimately connected with welding. Special attention is given to aluminum welding. Instruction is given in the use of cutting torches, including the company's mechanically-operated torches known as the Oxygraph and Radiagraph. Detailed information as to the course of instruction and the charge therefor can be had by addressing the Davis-Bournonville Institute.

Synthetic Cast Iron or Iron from Steel Scrap

Synthetic cast iron is the name given in France to castings produced in the electric furnace from steel scrap with suitable additions to increase the carbon content of the metal. The process was also used extensively in that country for making shells, says an authority, M. Pinot, its monthly output after the middle of 1916 having been 7500 tons per month.

The American Forge & Machine Co., Canton, Ohio, manufacturer of drop forgings, pressed or hammered steel forgings, and open hearth vanadium and chrome nickel steels, recently added another steam hydraulic forging press to its forge shop.

Industrial Paralysis Narrowly Escaped

Production in the Chicago District Greatly Reduced—Drastic Orders Canceled Upon Receipt of News of Expected Settlement of Coal Strike

CHICAGO, Dec. 9.—A drastic order shutting off electric light, power and gas from non-essential industries in this city was canceled by the fuel authorities following the receipt of news of the almost certain settlement of the coal strike. The lifting of this regulation will permit plants which have fuel stocks to continue operation on a six-hour day until a resumption of mining makes a continuation of the present fuel conservation measures unnecessary. The news of the probable compromise came in the nick of time, as practically all industries, including iron and steel producers, were suspending or at least materially curtailing operation.

Many Idle Men

On Dec. 6, approximately 225,000 workers in the Chicago industrial district had been thrown out of employment because of the coal shortage, according to an estimate made by John M. Glenn, secretary of the Illinois Manufacturers' Association. The order of the regional fuel authorities, which was to have become effective to-day, would have cut off all light, heat and power, supplied by public service companies, from industries not on the Fuel Administration's preferred list, previously published in THE IRON AGE. This ruling would have forced many "non-essential" industries which have a good supply of coal to suspend operation. Iron and steel plants and foundries whose fuel needs received special attention during the war because of their important place among our instruments of defense, are classed as non-essential industries under the fuel regulations. Plants in this class were promised only sufficient allotments of coal from the fuel authorities for protection against fire and freezing. They were also warned that if they exhausted their present supplies in an effort to continue operation they could expect no further deliveries to protect their properties during the remainder of the winter.

Numerous Drastic Orders

The past week has been marked by a succession of drastic orders in the interests of fuel conservation. Beginning on Dec. 4 all factories, office buildings and mercantile establishments, with a few exceptions, were restricted to the use of electric light, gas and power between 9 a. m. and 3.30 p. m., while downtown department stores were authorized to use service between 11 a. m. and 5.30 p. m. only. This order of the State Public Utilities Commission was followed by a reduction in the supply of light, heat and power by the Chicago Sanitary District to an amount sufficient to keep non-essential industrial plants from freezing. The action of the sanitary board, which closed about 200 plants, was followed by a similar restriction of service by other light and power utilities, effective to-day. Both orders are now canceled.

Use of Fuel Oil

The coal shortage created an unprecedented demand for fuel oil by industries in this section of the country. Many plants are now burning oil under their boilers and the steel manufacturers are using it much more extensively to operate their open-hearth furnaces. A bar iron mill is using oil in its heating furnaces. Among the industries which have put their boilers on oil are:

Wisconsin Steel Co., South Chicago.
Interstate Iron & Steel Co., Grand Crossing, South Chicago and East Chicago.
Western Steel Car & Foundry Co., Hegewisch, Ind.
Ryan Car Co., Hegewisch, Ind.
National Malleable Castings Co., Chicago.
O'Malley-Beare Valve Co., Chicago.
Bates Machine & Tractor Co., Joliet.
Decatur Bridge Co., Decatur, Ill.
Nash Motors Co., Kenosha, Wis.
George H. Smith Steel Castings Co., Milwaukee.
Falk Co, manufacturer of gears, Milwaukee.
A. O. Smith Corporation, automobile builder, Milwaukee.
Briscoe Motor Corporation, Jackson, Mich.

Rapidly Rising Prices

Unfortunately a further expansion in the use of fuel oil has been inhibited by rapidly rising prices. Oil, which before the strike sold at about $1 a barrel, has been commanding from $3 to $4.50. Responsible sellers who had cultivated this market for several years have found it difficult to supply the needs of their customers with speculators competing for the product of the producers at much higher prices. On the complaint of Senator Capper of Kansas, Attorney-General Palmer, on Dec. 6, instructed Federal agents to proceed at once against producers who took advantage of the fuel shortage to advance the price of their product. Concurrently, the Railroad Administration declared an embargo, effective to-day, against the shipment of fuel oil from the West to points east of Chicago and St. Louis. This action was taken to conserve the small supplies of coal available in the territory west of the Illinois-Indiana boundary.

Iron and steel production has steadily diminished as a result of the coal shortage. The Illinois Steel Co. has only five blast furnaces in blast at South Chicago, with six idle. At Gary eight furnaces are in, four are idle.

The operation of the finishing mills is irregular, and at South Chicago the No. 1 open-hearth plant has been shut down. At Joliet the only plants operating are one blast furnace and one battery of coke ovens. The Illinois Steel Co. is also among the industries which are making a more extensive use of oil, practically all of its open-hearth furnaces now being on oil and tar.

The Inland Steel Co., which exhausted its supply of steam coal about two weeks ago, is making heavy inroads on its stocks of coking coal and oil to keep running. It faces a material curtailment in production unless early relief is forthcoming with the resumption of mining. The third local steel interest and the leading merchant iron producer are in a similar position. The Wisconsin Steel Co., South Chicago, has reduced operations in its by-products coke plant and fears that similar action may have to be taken in other departments of its works. Among the smaller rolling mills which had not closed when the last report on the fuel situation was published, the Calumet Steel Co. closed its rail carbon bar mill at Chicago Heights, Ill., on Dec. 6. The Sellers Mfg. Co., manufacturer of tie plates, Chicago, operated for four days last week and hopes to run for a few days this week. The Pollak Steel Co., South Chicago, has been forced to release 200 employees.

Conservation of Coal at Milwaukee

MILWAUKEE, WIS., Dec. 9.—War-time machinery for the conservation of bituminous coal was reinstituted in Milwaukee county on Dec. 4 in view of the critical situation which threatened the entire country as the result of the coal miners' strike and consequent acute shortage of soft coal supplies. The most conspicuous conservation measure introduced is an order issued to all manufacturing industries in Milwaukee county to the effect that on and after Dec. 8 every plant is placed on the basis of operating not more than six hours a day, nor more than six days a week, and in any event, not more than 36 hours a week. Exemptions will be

made only in the most urgent cases, and work must be arranged so far as possible for hours when daylight can be utilized, according to the order of W. N. Fitzgerald, fuel administrator for Milwaukee county. Violations of the order, he said, would result in orders for a complete suspension of operations by a withdrawal of coal, gas, electric and other necessary supplies.

Industries Resume After a Short Suspension

MILWAUKEE, WIS., Dec. 10.—Milwaukee industries, after a complete shutdown Monday, resumed operations Tuesday under a temporary ruling permitting manufacturers with soft coal supplies in own bins and those deriving power from public utilities current to operate 36 hours per week. Restrictions on beehive coke are expected to sharply curtail foundry operations when small existing supplies are exhausted.

Much criticism is being offered by manufacturers and merchants of Milwaukee of the Government's policy of permitting coal on Milwaukee docks to be taken for railroad use.

Serious Steel Shortage at Detroit

DETROIT, Dec. 9.—The steel shortage situation in Detroit has become suddenly very serious indeed, and appears to be growing worse from day to day. This is true of virtually every Detroit and Michigan industry in which steel in fabricated form or otherwise is a component part. It is particularly true of the automotive industry.

Even had the automotive industry been fully prepared for such a strike as crippled the steel industry of the country, the curtailed steel production during the first few months of the year, lack of operating funds on the part of the manufacturers, due to confusion and long delay of the Government in closing up war contracts, and the fluctuating condition of the steel market would have prevented them from laying in large supplies. As matters stood, most concerns had supplies of from two weeks to six weeks. These, together with the reserve supplies of the steel mills, kept things going until this time.

To-day, however, reports of sharp curtailment in production come in from every hand.

Unless the next few days bring relief, manufacturers in this section predict the temporary abandonment of all plans for increased production schedules, if they do not curtail present production itself. The automotive industry, nearly every unit of which had planned production increases of 33 1/3 per cent to 100 per cent, will suffer most. This chiefly because the parts makers, who are often small fellows without sufficient financial backing, have been hardest hit by the governmental delay in settling war contracts, and consequently in few cases had any opportunity to lay in any steel reserve supply whatever.

An indication of how matters are going in Detroit and Michigan is given by the case of one of the biggest makers of motor car axles, which has cut production 40 per cent, because unable to maintain a steady steel supply.

The best of tested, standard steel is used in the automotive industry, and the men who make this steel must know their jobs. No steel company can maintain quality with a crew of untrained strike-breakers. Yet this is the situation that will exist at many plants until new men have been properly trained.

Fuel Shortage Curtails Production in Ohio

YOUNGSTOWN, OHIO, Dec. 9.—Fuel shortage upset schedules of Mahoning valley blast furnaces and steel plants, just as they were making big jumps toward normal after suspension due to the steel strike. Evidences of the labor disturbance have almost wholly disappeared. Every company in the district has an oversupply of applications, though common labor continues scarce. It is expected by Valley manufacturers that the condition will be reflected Dec. 13 at a meeting of the national committee of the American Federation of Labor in charge of the strike, in Washington, when presidents of the 24 international unions involved will likely vote to end the strike. Workers have returned literally in droves and there has been a corresponding reaction against the agitators responsible for the disturbance. Many cases are cited where foreigners who quit work at the behest of strike leaders have torn up their union cards. The sentiment prevails here in conservative labor circles that the strike has immeasurably harmed the cause of organized labor.

Indicating how fast normal operations were being reached are the schedules of the principal companies. The Carnegie Steel Co. was running practically 100 per cent at the Ohio works, Union mills and the McDonald plant. All six blast furnaces at the Ohio works are blowing, and only the detached stack at Niles is down. The Youngstown Sheet & Tube Co. is operating its four East Youngstown furnaces and 10 of 12 open hearths. Were it not for the fuel situation, the corporation's two furnaces at Hubbard, Trumbull county would be fired. The Brier Hill Steel Co. has two of three furnaces producing metal, one being down for relining, while 10 of 12 open hearths are being tapped. The Republic Iron & Steel Co. has three of five blast furnaces in commission and nine of 14 open hearths.

Pinch of fuel shortage is being felt, however. Seven open-hearth furnaces operated by Trumbull Steel Co. are idle and all plants curtailed this week. To prevent physical deterioration of by-product coke ovens, which would ensue should coking be discontinued, companies operating such units are endeavoring especially to keep these plants supplied. Thus far steel companies using electric power generated by the Republic Railway & Light Co., at its Lowellville powerhouse, have had the advantage over those with their own power plants. The two plate mills of the Brier Hill Steel Co., the Truscon Steel Co. and the William B. Pollock Co. secure their power from the Republic Railway & Light Co., while the Republic Iron & Steel Co. is also partially supplied from this source.

The A. M. Byers plant at Girard, Trumbull county, consisting of blast furnace, rolling mill and 88 puddle mills has reduced its operations to one-fourth of normal because of coal scarcity.

Though the Youngstown Sheet & Tube Co., Brier Hill Steel Co., Republic Iron & Steel Co. and Trumbull Steel Co. operate their own coal mines in Pennsylvania, the output has been largely confiscated by the Government.

All plants are running on a "hand-to-mouth" basis, with coal stocks reduced to minimum and further defections in departmental operations inevitable unless the coal supply is replenished.

May Apply for Patents

WASHINGTON, Dec. 9.—The Federal Trade Commission has granted a blanket license to Americans and American corporations to resume the filing and prosecution of applications "in enemy and ally of enemy countries" for letters patent and for registration of trade-marks, prints, labels and copyrights.

Under the auspices of the Carpenters' Union, of Alpena, Mich., a "building bee" was staged in that city a few Sundays ago to roof over a 60-foot wing of the new building of the Besser Mfg. Co. Inability to obtain enough carpenters to do the job during the week led the union to suggest that the work be done on Sunday. The suggestion met with instant approval, with the result that more than 50 carpenters answered the call.

An Appreciation of Henry Clay Frick

The sudden and unexpected death of Henry C. Frick in New York on Tuesday morning, Dec. 2, removed from industrial life a man who perhaps was less understood than any other who has occupied so prominent a place in the business world. The acquaintance of the writer with Mr. Frick goes back more than 30 years. Even at that time he was an important figure in business, largely because of the great success he had already achieved, especially in the development of the Connellsville bee-hive coke industry, and also because of his methods, which were much different from those of many of his business associates, notably Andrew Carnegie. Mr. Frick shunned publicity; Mr. Carnegie courted it. Mr. Frick did not seem to possess to large degree the happy faculty of cultivating friendships in business, and yet those who knew him best swore by him. Once Mr. Frick laid out a path, he traveled it to the end, no matter what the result, and he nearly always achieved his purpose. He was at times brusque in manner, but he had a kindly heart, and to those who were fortunate enough to be counted as his business and personal friends he was loyal to the last degree.

Perhaps Mr. Frick's greatest work in his earlier career, a work that is still being perfected by his associates in the Frick Coke Co., was the complete transformation he and they have made in living and working conditions in the great Connellsville coal and coke districts. When Mr. Frick began to make himself known and to impress himself upon the Connellsville coke trade, living and working conditions were probably as bad as they could be. Most of the coal miners and coke workers lived in houses that were only hovels, and could not by any stretch of the imagination be thought of as homes. In the building of these houses no thought was given to sanitation, or of environments that would go to make better men physically or morally; in fact, little or no attention was given by coke producers at that time to living conditions of their men. Labor unions were in control, and there was constant struggle between the coke operators and their employees, often accompanied by bloodshed and loss of life. Sometimes conditions became so bad that State troops were called on to quell rioting and disorder and prevent damage to coal mines and coke plants by the misguided men.

Mr. Frick saw that radical measures were necessary to correct these terrible conditions, and one of the first things he did was to non-unionize the Connellsville region, this being accomplished only after a long and bitter strike. Mr. Frick then announced to those in charge of the Frick coal and coke plants that living and working conditions must be improved, regardless of the cost in money; and they were. Mr. Frick had a valuable ally in Thomas Lynch, who was for many years president of the Frick Coke Co. To appreciate what was accomplished one has to know of the ideal conditions existing to-day among the Connellsville coal and coke workers, as compared with those of some years ago. Mr. Frick and his associates fully realized that by providing ideal environments for their men they would bring out their best qualities. After giving their employees good, comfortable homes, various forms of recreation and opportunity for wives and mothers to learn the domestic arts were provided, and they also showed their employees how to go about cultivating to high degree flower and vegetable gardens, which are a part of nearly every home in the Connellsville region in which a Frick employee lives. The employees were taught the advantage of the better things of life, were given free medical attention, low rents, cheap coal; in fact, a careful study was conducted, and is still being made, for steadily improving the surroundings of these men. Most of them are foreigners, who had to be taught like children to turn away from filthy home living and all that goes with it. In this great work Mr. Frick kept in the background, but his was largely the guiding hand that secured such wonderful results. It is no breach of confidence to say that on more than one occasion Mrs. Frick was consulted by him as to what more he could do for the betterment of his employees. He never counted the cost, so long as the much-desired end was served.

Much could be said of Mr. Frick's quiet benefactions in Pittsburgh and other places, many of which will likely never be told in print. His voluntary action in making good the deposits of school children in a Pittsburgh savings bank that failed a few years ago is only one of scores of gifts he made involving large amounts of money, and usually given under a pledge of secrecy and the assurance that his identity would not be made known. Mr. Frick was always quick to come to the aid of Pittsburgh when money was needed for any purpose looking to the betterment and the growth of Pittsburgh institutions maintained for the public benefit. He was a large contributor to hospitals and to other public institutions. Only recently there have come to light two or three cases where he has given large sums of money for years to institutions ministering to the public welfare. His intense love for the arts and for flowers and his spending of millions for the masterpieces are already well known. He maintained at Clayton, his Pittsburgh home, a large conservatory, which was thrown open to the public for a period each year.

Mr. Frick took keen interest and pleasure in making money, but he also took just as much pleasure in giving it away where it was needed and would do good. No man has done more for Pittsburgh than Mr. Frick, possibly excepting Andrew Carnegie; but he had his own ideas as to how he could best help his home city, and he followed them religiously.

His death is a loss to Pittsburgh and to the entire country that cannot be measured. He was a self-made man, one whose choices were largely made without concert with others, but he had an abiding regard for the general good, and it can be truly said of him that the world is better because he has lived in it.

Pittsburgh, Dec. 3. ROBERT A. WALKER.

Inland Steel Co. to Install Powdered Coal Equipment

The Inland Steel Co. will install a complete powdered coal system for firing the 40 furnaces in its plant at Indiana Harbor, Ind. For the initial installation, powdered coal will be applied to 16 sheet furnaces, 16 pair furnaces, 3 continuous plate mill furnaces, 2 continuous bar mill furnaces and 3 slab heating furnaces. The contract which has been awarded the Quigley Furnace Specialties Co., 26 Cortlandt Street, New York, calls for the engineering work and installation of a complete milling plant of 20 tons an hr. capacity with provision for extensions, compressed air distribution system for transporting pulverized fuel to furnace bins, and the necessary fuel feed controllers, air supply system and burners. Extensions are to be made to the boiler plant and other departments.

Transfer of Titusville Forging Plant

The Bethlehem Steel Co. has sold its forging plant at Titusville, Pa., purchased from the Titusville Forge Co. about seven years ago, to a group of men headed by John T. Dillon, Jr., of Titusville. Mr. Dillon has been the general manager of the property. Associated with him in the purchase are his father, John T. Dillon, and others. The new owners have not announced their organization as yet, but the plant will be continued in operation on its regular lines of work, including marine forgings of all kinds, rough and finished crankshafts and other forgings up to 40,000 lbs. The Dillon interests owned the property originally, when it was purchased by the Bethlehem Steel Co.

Loading Charge Restored

UNIONTOWN, Pa., Dec. 9.—Notice has been received here of the resumption of the 75 cents loading charge for team wagon mines which sprung up in the region in large numbers during the war, operations having been started without installation of expensive machinery, tipples or sidings. The order will affect approximately 200 of these mines which probably will resume immediately, work having ceased when the loading charge was removed by the Fuel Administration. These mines, under the new order effective as of Nov. 29, will be permitted to load coal for $3.10 a ton.

Crucible Steel Co. of America May Consolidate All Properties

Horace S. Wilkinson, chairman of the Crucible Steel Co. of America, informed stockholders at the annual meeting in Jersey City Nov. 21, that plans involving the consolidation of the parent corporation and its subsidiaries are under consideration and will probably be carried through if that step is found to be for the best interests of the shareholders. It is believed that between $2,000,000 and $3,000,000 in taxes would be saved by the merger.

The new Crucible Steel head also referred at length to his recent conference with the Internal Revenue Department at Washington regarding the adjustment of excess profits taxes which were found to be due the Government from the earnings of 1917 and 1918 when he was not officially connected with the company.

"By this clean-up of the tax question," he said, "we are now in the best position we have been in the past two or three years. Our stock is worth more money today than it was ever worth before. Settlement of the tax question has been arrived at and we are entirely safe in the Government's hands so far as penalties are concerned. The actual amount of additional taxes required will not exceed the amount lready set aside for that purpose."

At the conclusion of the meeting Mr. Wilkinson was extended a vote of thanks by the stockholders for his "complete, frank and courteous" statement regarding the affairs of the Crucible company. Gilbert M. Black, E. L. French, August Heckscher, A. W. Mellon and Nathan L. Miller were re-elected directors.

Crucible Steel Co's. Report

The annual report of the Crucible Steel Co. for the year ending Aug. 31, shows a net profit of $9,574,208, from which dividends of $1,750,000 have been paid on the preferred stock and $31.29 a share on the common stock, compared with $48.24 a share on common stock paid last year. The gross profits for the year amounted to $14,093,005, a falling off from the previous year of $5,846,220. The amount set aside for repairs and depreciation of property was $4,171,489 and interest on bonds of subsidiary companies was $347,308. The surplus, after payment of preferred dividends was $7,824,208, a decline from the 1918 figures of $4,237,919.

In his annual report to stockholders, chairman of the board, H. S. Wilkinson said that the company, while undergoing the change from a war basis to one of peace, had obtained its portion of usual commercial orders. He also pointed out that all improvements under way will be finished but the present policy is to discontinue further extensions in order, to increase the company's cash and current assets. He pointed out that during the last few years the company has been making its own iron ore investments, has opened coal mines, arranged for the housing of employees and added a new blast furnace and by-product coke oven, well under way to completion.

Canadian Locomotive Co. Makes Large Profits

Largest profits in its history were revealed in the annual statement of the Canadian Locomotive Co., Kingston, Ont., Sept. 18. The strike which has closed the works since early in May affected almost two months of the year covered by the statement. Operating profits last year were $848,683 and when to this is added $44,292 interest from investments there is a total of $892,976 for fixed charges, dividends, surplus, etc. Current assets have increased from $2,148,442 to $2,298,430, while current liabilities have been reduced from $1,037,620 to $633,754. The company's holdings in Canadian war and Victory bonds have been increased from $247,769 to $1,348,400. The interest on the present war bond investments, $75,000 per year, alone nearly meets the payment of interest on first mortgage bonds amounting to $90,000. The directors were re-elected as follows: Aemilius Jarvis, Robert Hobson, Warren Y. Soper, John L. Whiting, James Carruthers, M. J. Haney, F. G. Wallace.

Survey of Coke and Coal Prices

WASHINGTON, Dec. 1.—The Geological Survey is publishing a survey of the coal and coke industry prices from 1913 to 1918. This is of vital importance just at this time, because of the critical situation in which the state of the coal mining industry threatens to leave the coal consuming industries of the country. The document is a particularly valuable survey of the economic influence of the coal prices upon industry. The studies are the result of the work of C. E. Lesher of the Survey, in co-operation with the United States Fuel Administration and the War Industries Board.

"Mr. Lesher's report," says the announcement of the Survey, "shows in text, tables and diagrams, the fluctuations in prices from the beginning of 1913 to the end of 1918, the restraint on prices exercised by the Government control through the Fuel Administration, and the increase in prices that followed the advances in wages to mine labor."

By-product Coke Statistics

Interesting data on the consumption and output of the six batteries of 51 by-product coke ovens, Koppers Cross regenerative type, at the plant of the Youngstown Sheet & Tube Co., Youngstown, Ohio, are contained in the November issue of the *Bulletin*, published by the company. The amount of material daily consumed includes 5000 tons of coal, 250 tons coke breeze, 20,000,000 cu. ft. gas, 3.5 tons lime, 1600 lb. caustic soda, 1000 gal. "wash oil," and 69 tons of sulphuric acid.

The daily production at normal coking time is 3400 tons coke, 115 tons domestic coke, 250 tons coke breeze, 65 tons sulphate of ammonia, 50,000 gal. tar, 50,000,000 cu. ft. gas, 9250 gal. pure benzol, 2150 gal. pure toluol, 1000 gal. solvent naphtha. The practice of the company is to use both high volatile and low volatile coal.

It is pointed out if the above amount of coal were coked in bee-hive ovens, everything would be lost except the coke, and the production would be only 3000 tons instead of 3400.

Chrome Ore Mines Quit Producing

The domestic chrome-mining industry has practically gone out of commission, according to an announcement of the United States Geological Survey. Between Jan. 1 and July 1, 1919, only about 1400 tons of chrome ore were mined and shipped from three deposits—two in San Luis, Obispo County, Cal., and one in Wyoming. The two mines in California appear to have been closed down, at least for the present, so that the Ferro Alloy Co., in Wyoming, is the only active domestic producer. This condition shows a remarkable contrast to that which prevailed in 1918, when there were nearly 600 active owners and operators of chrome properties and the total quantity of ore shipped was 82,350 gross tons of all grades, by far the greatest annual output of domestic chrome ore ever marketed in this country. The imports of chrome ore in the first half of 1919 amounted to 19,658 gross tons.

Republic Earnings

The income account of the Republic Iron & Steel Co., Youngstown, for the quarter ending Sept. 30 shows net earnings from operations, after deducting charges for maintenance and repairs of plants, amounting to $1,740,406.99. Added to this is the interest and income from investments $135,478.31, which makes a total of $1,875,885.30. After deducting for depreciation and renewal of plants and exhaustion of mineral, the net profits for the quarter is $1,453,410.44 from which is deducted interest on bonds of $182,263.05, leaving $1,271,147.39 of net profits applicable to dividends. Provisions were made to pay preferred stock 1¾ per cent or $437,500 and common stock 1½ per cent or $407,865, a total of $845,365, which leaves a surplus for the quarter of $425,782.39.

Strike Over at Johnstown

When the steel strike started on Sept. 22, the Cambria Steel Co., Johnstown, Pa., closed its plant down entirely, and for a long time made no effort to resume. The labor leaders in charge of the strike made a special effort to organize employees of the Cambria Steel Co., but without success. Late last week, T. J. Convoy, leader of the steel strike in Johnstown, closed up his accounts with the Labor Temple in that city, and left the place. Convoy has been in Johnstown for nearly a year, and partly succeeded in building up a strike organization among the employees of the Cambria works. However, this organization is disrupted, and its former members have renounced the union and returned to their old jobs.

Chicago Company's German Plant Being Restored to Owners

The Chicago Pneumatic Tool Co., Chicago, reports orders booked during October in excess of any previous month since the armistice. The same is true of its English and German subsidiaries. While its German subsidiary was seized by the German Government and has been run under "compulsory administration" since the United States participation in the war, the management is being transferred to the company through the Courts of Commerce, according to cable reports just received from the company's representative, now returning from Berlin. Reports show the German company was well managed during the war and is now operating on a satisfactory basis. Arrangements have been made to materially increase production.

Canadian Car & Foundry Co. Report

The consolidated income account of the Canadian Car & Foundry Co., Ltd., for the fiscal year ended Sept. 30, last, shows a combined profit of $2,993,470, which is $1,623,921 less than that for the previous year. The profit for the year, before government taxes and after the 8¾ per cent dividends on the preferred stock, is equal to $24.75 per share on the corporation's common stock. During the previous year, the company paid 3½ per cent on its preferred stock, and its profits then were equal to $60.13 per share on the common stock.

The aggregate sales of the company during the past year amounted to $33,000,000. As to the future, the report states that the main company, the car company, has sufficient orders on hand to keep it operating at capacity into 1920, but as might be expected, the outlook beyond then is uncertain.

New Republic Stock

The Republic Iron & Steel Co., New York, will issue 26,480 shares of unissued common stock on Dec. 26, to which holders of common stock will be entitled at the rate of one share for every ten shares on record at the close of business that day. Subscription warrants will be issued for amounts of $100 or multiples. These warrants will be presented by stockholders, properly endorsed and paid in full on or before Jan. 16, 1920. The new issue will not share in the common stock dividend payable Jan. 15, 1920. Shearson, Hammill & Co., 71 Broadway, New York, are purchasing all shares not subscribed for by stockholders.

The Inland Steel Co., Chicago, will reincorporate and recapitalize as an Illinois corporation. The company is now organized under the laws of Delaware and is capitalized at $30,000,000, divided into 300,000 shares of $100 par value. A meeting of stockholders has been called for Dec. 16, to vote on the directors' proposal to change the stock issue to 1,200,000 shares of $25 par value, which will be issued four for one to stockholders. With the organization of the Illinois corporation it is proposed again to change the stock to a new issue of no par value, which will be exchanged share for share for the $25 par value stock.

IRON AND INDUSTRIAL STOCKS

Coal Situation Causes Irregularity but Most Issues Are Higher

NEW YORK, Dec. 8.

The past week has witnessed a healthy recovery in values of stocks in general, United States Steel, Crucible Steel, Republic Iron & Steel, Bethlehem B, General Motors and most of the other important industrials being materially higher than they were a week ago. The recovery has been especially gratifying in view of developments in the Mexican situation. The performance of United States Steel, selling ex-dividend, has been especially noticeable. General Electric is one of the few highly important industrial stocks that has failed to benefit by the market's general recovery.

During the last day or two, however, the market has developed irregularity owing to the uncertainty of the coal situation and its relation to our industrial activity. But in view of the rather pessimistic newspaper reports from various sections of the country, especially from the Middle West, the market as a whole has held up remarkably well, which would seem to indicate a feeling in certain quarters that the coal question will be settled at an early date.

Many of the copper properties, some of them of the utmost importance, have been obliged to close owing to the lack of coal. The copper stocks have held up well in view of such developments, quite a few of them actually showing net gains for the week. Their action is based on the supposition that an enforced shut-down will materially help the surplus metal supply situation and ultimately bring about an upward readjustment of quotations for the red metal.

The range of prices on active iron and industrial stocks from Tuesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	41	45	Gulf States St'l..	66¼	70½
do., pfd.	91½	95	do., 1st pfd...	70	70¾
Am. Can, com..	50¾	54½	Int. Har., com...	126½	132
do., pfd.	100¼	102¼	do., pfd.	....	114
Am. Car & Fdy., com.	134½	141¾	Lackaw'na Steel	82½	87
do., pfd.	116	116¼	Lake Sup. Corp.	19¾	20¾
Am. Loco., com.	93	96¼	Midvale Steel...	49½	50¾
do., pfd.	105¾	107	Nat-Acme	37⅝	38
Am. Ship, com..		119	Nat. Enam. pfd.	78	83¼
Am. Steel Foundries, com....	39¾	43½	N. Y. Air Brake.	107	112
do., pfd.	91½	93	Nova Scotia St'l.	73	75
Bald. Loco., com.	106½	112½	Press. Steel, com.	96	101½
do., pfd.	....	105½	Ry. Stl. Sp., com.	95½	98¾
Beth. Steel, com.	89	92½	do., pfd.	....	107¼
do., class B...	91	95½	Republic, com...	103⅞	110
do., 8 pct. pfd..	112¾	114½	Sloss, com.	70	74¼
Case, J.I., pfd..	99	...	Superior Steel...	44¼	45
Chi. Pneu. Tool	105	108	Transue-Will. ..	60½	63
Colo. Fuel	37⅝	40	U. S. Alloy Steel	49¾	51
Cruc. Steel, com.	200½	218	U. S. Pipe, com.	20½	22½
do., pfd.	99	100	do., pfd.	....	57
Deere & Co., pfd.	99¾	100	U. S. Steel, com..	102¼	105¼
Gen. Electric....	166	174	do., pfd.	112	114¾
Gt. No. Ore Cert.	38	39⅞	Va. I. C. & Coke	67	72
			Westinghouse E.	51⅝	54

Industrial Finances

A public offering of $6,000,000 Hydraulic Steel Co. 7 per cent cumulative convertible preferred stock at 100 and accrued dividend is being made. The company is being organized in Ohio to take over the Hydraulic Pressed Steel Co., Cleveland, and its subsidiaries.

The stockholders of the Timken Detroit Axle Co. have authorized an increase in the common stock from $3,000,000 to $30,000,000 and the reduction of the par value of the stock from $100 to $10. The company's $3,000,000 7 per cent cumulative preferred stock will be increased to $18,000,000.

Negotiations are in progress with an English syndicate for the construction of a plant in England to handle the foreign business of the United States High-Speed Steel & Tool Corporation.

The October profits of the Gulf States Steel Co. were $53,371, as compared with $42,228 in September, $12,989 in August, and a deficit of $9,442 in July. The company within a few months will have completed the development of its 1,600-acre iron ore property.

The Slick-Knox Steel Co., with a plant at Wheatland, Pa., has filed a notice of an increase in its capital stock from $500,000 to $1,295,000.

Iron and Steel Exports Show Decrease

Movement to Foreign Lands in October Declines in Tonnage, Although Valuation Increases Slightly—Semi-finished Steel Falls Off Sharply—Imports Increase

WASHINGTON, Dec. 9.—Although showing a slight increase in valuation over the September, 1919, figures, the statistics of the iron and steel exports for October, 1919, revealed a marked decrease in tonnage. The only increase in tonnage in the entire figures was in fabricated steel, and the machinery exports kept the total movement on the upward trend. The high exchange rate doubtless had a weakening effect, also, on the October totals.

In October, 1919, the exports of the various manufacturers of iron aggregated $76,172,791, against $73,378,468 in September, 1919; and $80,719,885 in October, 1918. For the 10 months ending with October, 1919, the figures were $834,214,463,—a decided drop from the figure of the corresponding period of 1918, which was $870,620,190.

In October, 1919, the outgo of iron and steel was 302,456 gross tons. In September, 1919, this total was 363,505 gross tons; in October, 1918, it aggregated 388,777 gross tons. The export of iron ore in October, 1919, was 136,750 gross tons, against 222,705 in September, 1919, and 199,238 gross tons in October, 1918.

Exports of Iron and Steel

	October		Ten Months	
	1918 Gross Tons.	1919 Gross Tons.	1918 Gross Tons.	1919 Gross Tons.
Ferromanganese	52	934	3,456	2,917
Ferrosilicon	56	6	3,246	4,796
All other pig iron	35,344	13,168	207,423	277,507
Scrap	443	2,335	2,122	17,014
Bar iron	6,018	2,687	45,800	55,783
Wire rods	11,609	8,810	124,746	102,633
Steel bars	38,963	45,179	503,067	477,239
Steel billets, ingots and blooms, n.e.s.	125,023	20,713	1,572,375	223,675
Bolts and nuts	2,120	2,521	20,128	35,175
Hoops and bands	3,238	3,884	42,060	44,316
Horseshoes	241	52	2,590	3,059
Cut nails	152	126	3,353	2,679
Wire nails	6,065	5,323	64,145	81,774
All other nails, including tacks	1,040	753	9,805	14,619
Cast-iron pipes and fittings	2,439	1,623	52,372	30,202
Wrought iron pipes and fittings	5,889	17,490	73,833	309,325
Radiators and cast-iron house-heating boilers	161	275	2,015	3,769
Railroad spikes	381	1,294	8,329	22,804
Steel rails	49,495	43,730	375,625	563,958
Galvanized sheets and plates	2,914	6,758	58,708	87,295
All other sheets and plates	1,925	2,426	37,344	35,944
Steel plates	52,967	40,660	432,128	598,569
Steel sheets	8,275	13,861	144,430	157,051
Plates, punched and shaped (ship)	2,575	1,114	25,641	11,193
Structural iron and steel	13,265	26,641	188,820	322,238
Tin and terne plates	14,424	11,938	189,979	170,218
Barb wire	29,311	11,711	207,849	82,628
All other wire	13,392	16,444	132,481	170,128
Total	388,777	302,456	4,531,618	3,908,508

The exports of the various forms of pig iron dropped to 14,108 tons in October, 1919, against 18,991 in September, 1919, and 33,452 in October, 1918.

A year ago, France received 1,649 tons of this total. This year it received none; but the export to Italy was 1,621 tons in October, 1918, and 2,785 in October, 1919. Exports to the United Kingdom amounted to 13,010 in October, 1918, and 2,860 in October, 1919. The exports to Canada, for October, 1918, were 18,150, and in October, 1919, 1,046.

The largest individual slump was that in the export of steel billets, ingots and blooms. In October, 1918, these had totaled 125,025 gross tons; in October, 1919, they had dropped to 20,713 tons. In September, 1919, they had already dwindled to 37,513 tons. Here, it is interesting to note that the United Kingdom was the largest purchaser. It received 11,892 tons of these commodities in October, 1919, against 51,333 a year ago. France received 4,366 instead of 48,696 tons in October, 1918. Canada received only 257 tons against 19,272 a year ago; and Italy fell to 3,794 from 5,716 tons.

Steel rails were exported to a total of 43,730 tons in October, 1919, against 58,424 in September, 1919, and 49,495 in October, 1918. Japan proved the biggest customer for steel rails this year. It received in October, 1919, 13,505 gross tons, against 1,610 a year ago. Cuba received 6,454 tons, against 3,994 a year ago; and Brazil, 2,700 tons, where it had received none in October, 1918. France, however, bought only 1,726 tons, against 25,879 in October, 1918; and Canada received 543 tons instead of 4,070 a year ago.

Exports, 1919—January to October

	Gross Tons		
	All Iron and Steel	Pig Iron	Semi-finished Material
January	360,456	35,793	11,594
February	234,793	20,178	10,407
March	344,506	22,054	8,176
April	408,204	16,300	11,488
May	447,050	32,233	20,771
June	544,580	39,540	46,016
July	287,823	38,373	21,318
August	396,743	36,071	36,162
September	363,505	18,991	37,513
October	302,456	14,108	20,713
Total	3,690,116	273,641	224,158

Steel plates totaled 40,660 gross tons, against 52,885 in September, 1919, and 52,967 in October, 1918. The end of the war was emphasized by the drop in barbed wire. In October, 1918, the last month before the armistice, this export aggregated 29,311 tons. In September, 1919, it had dropped to 9,515 tons, but rose to 11,711 in October, 1919.

The most interesting of the increases is that in wrought iron pipes and fittings. These exports totaled 17,490 in October, 1919, against 5,889 tons in October, 1918. The September, 1919, figure, however, is remarkably near the October total, at 17,159. Steel sheets also stood near the September figures—the latter were 13,880 gross tons, while the October figures were 13,861 gross tons. October, 1918, showed only 8,275 gross tons.

Imports of Iron and Steel

	October		Ten Months	
	1918 Gross Tons.	1919 Gross Tons.	1918 Gross Tons.	1919 Gross Tons.
Ferromanganese	200	4,025	26,471	22,674
Ferrosilicon	733	1,601	2,581	7,235
All other pig iron	...	12,755	1,973	42,419
Scrap	8,616	19,673	40,546	141,900
Bar iron	2	106	1,285	1,354
Structural iron and steel	628	47	2,694	790
Steel billets without alloys	3,183	781	27,787	3,907
All other steel billets	255	633	6,247	3,791
Steel rails	1,196	590	6,762	15,256
Sheets and plates	5	44	1,383	761
Tin and terne plates	...	3	32	147
Tin scrap	244	395	5,459	4,598
Wire rods	438	52	7,506	201
Total	16,000	40,705	140,418	245,033
Imports of Manganese Ore and Oxide				
Manganese, ore and oxide of	48,917	15,863	431,299	285,274

Structural iron and steel showed a decided increase, rising to 26,141 gross tons in October, 1919, against 21,933 tons in September, 1919, and 13,265 tons in

Exports of Machinery

	October		Ten Months	
	1918	1919	1918	1919
Adding machines	$149,996	$297,412	$1,542,934	$3,434,581
Air-compressing machinery	342,012	343,228	2,198,723	3,170,444
Brewers' machinery	.....	1,158	91,626	149,044
Cash registers	22,778	735,273	540,210	3,273,543
Parts of	13,185	37,157	76,231	238,044
Concrete mixers	19,344	21,819	287,233	166,261
Cotton gins	3,798	1,405	85,249	289,766
Cream separators	74,852	106,162	647,967	1,012,530
Elevators and elevator machinery	160,403	118,120	1,609,098	2,393,602
Electric locomotives	.....	51,130	98,635	790,788
Gas engines, stationary	56,066	78,994	427,895	534,014
Gasoline engines	2,667,466	2,422,528	30,838,487	28,790,221
Kerosene engines	752,763	587,707	6,088,782	7,006,857
Steam engines	1,106,520	5,698,233	26,391,877	27,583,583
All other engines	1,040,906	138,387	4,176,947	3,014,864
Boilers	222,844	501,567	3,631,201	4,984,279
Boiler tubes	529,174	263,220	4,898,773	7,365,616
All other parts of engines	1,876,870	1,570,410	19,656,729	21,360,855
Excavating machinery	136,936	163,473	1,162,307	888,529
Milling machinery, flour and grist	95,609	77,658	1,084,245	2,016,962
Laundry machinery, power	37,750	62,046	356,963	599,052
All other	24,674	23,777	195,924	320,123
Lawn mowers	21,903	23,712	159,745	437,695
Lathes	799,775	784,964	8,657,918	8,881,344
Other machine tools	865,448	927,881	8,880,024	10,646,839
Sharpening and grinding machines	613,909	468,963	5,428,637	4,810,218
All other metal-working machinery	2,550,494	2,897,778	20,567,341	26,217,816
Meters, gas and water	25,767	75,853	332,771	659,024
Mining machinery, oil well	216,957	147,513	2,208,195	2,810,907
All other	352,663	485,582	7,616,869	8,226,096
Paper-mill machinery	43,098	213,289	1,291,693	3,455,604
Printing presses	111,385	307,811	1,065,079	2,904,753
Pumps and pumping machinery	476,325	852,394	4,966,326	7,504,386
Refrigerating and ice-making machinery	79,518	197,917	1,150,735	1,862,521
Road-making machinery	32,395	131,855	541,774	833,842
Sewing machines	734,613	799,172	6,335,257	10,327,718
Shoe machinery	111,323	346,124	1,057,083	2,402,078
Sugar-mill machinery	805,976	1,807,312	6,944,680	10,686,865
Textile machinery	515,635	1,148,503	5,785,139	12,590,501
Typesetting machines	102,468	221,791	1,051,877	3,412,002
Typewriting machines	538,046	1,494,840	5,716,358	14,505,007
Windmills	41,049	72,548	624,279	886,868
Wood-working machinery, saw mill	104,545	61,495	845,897	1,049,428
All other	91,128	275,490	804,124	2,157,797
All other machinery and parts of	3,518,113	6,494,569	34,711,893	61,760,825
Total	$28,488,426	$33,530,888	$232,841,730	$317,813,692

October, 1918. Here France made a decided increase in its purchasing, taking 6,091 gross tons in October, 1919, against 808 a year ago. Canada received 6,255 gross tons in October, 1919, against 7,337 a year ago. Japan's share was 2,079 in October, 1919, against 749 in October, 1918; and Cuba received 3,748 in October, 1919, against 833 in October, 1918.

The exports of machinery showed an increase, both over the figures of September, 1919, and of October, 1918. The strike apparently had little influence in the machinery market. In October, 1919, the exports of machinery totaled $33,530,888. In September, 1919, this figure was $29,655,048; in October, 1918, it aggregated $28,488,426. For the ten months period ending with October, 1919, the machinery exports totaled $317,813,692. For the same period a year ago, they aggregated $232,841,730. The exportation of metal-working machinery in its various forms aggregated $5,079,586 in October, 1919, against $3,871,498 for the preceding month; and $4,829,626 a year ago.

Steam engines jumped to $5,698,233 in October, 1919, against $2,675,285 in September, 1919, and $1,106,520 in October, 1918. Sugar mill machinery totaled $1,807,312 in October, 1919, against $1,227,768 in September, 1919, and $805,976 in October, 1918. The textile machinery total was $1,148,503 in October, 1919, against $1,371,923 in September, 1919; and $515,635 in October, 1918. The export of typewriters aggregated $1,494,840 in October, 1919, against $538,046 a year ago.

The total exports of wire and manufactures of wire was $3,522,474 in October, 1919, against $3,346,257 in September, 1919; and $5,510,966 in October, 1918.

On the import side of the ledger, the tonnage figures show decided increase as compared with a year ago, and a slight fall from the September total. Imports of iron and steel aggregated 40,705 gross tons, against 43,892 in the preceding month, and 16,000 tons for October, 1918. This makes a total for the ten months ending with October, 1919, of 245,033 gross tons, against 140,418 gross tons for the corresponding period of 1918. Valuation of the imports of iron and steel was $2,173,138 for October, 1919, against $2,448,836 in September, 1919, and $1,713,980 in October, 1918.

For the 10 months period, despite the abnormal increase in tonnage, the imports aggregated only $19,855,608 in the first 10 months of 1919, against $20,048,738 in the same 10 months of the preceding year. This is largely due to the fact that the chief item of increase consisted of scrap. In October, 1919, the scrap imports aggregated 19,673 gross tons, against 24,668 gross tons in September, 1919, and only 8,616 tons in October, 1918. The imports of pig iron of various kinds aggregated 18,381 gross tons in October, 1919, against 17,838 tons in September, 1919, and only 933 in October, 1918.

The imports of machinery in October, 1919, were only $195,032, against $388,308 in September, 1919, and $404,705 in October, 1919.

The imports of manganese ore and oxide of manganese in October, 1919, were 15,863 tons, valued at $593,945; against 48,917 tons in October, 1918, valued at $1,618,510. For the 10 months ending with October, 1919, they aggregated 285,274 tons worth $9,944,962; against 431,299 tons in the same period a year ago, with the valuation of $13,158,216. O. F. S.

Small Increase in Steel Corporation Orders

Unfilled orders on the books of the United States Steel Corporation, Oct. 31, were 6,472,668 tons, compared with 6,284,638 tons on Sept. 30. This is an increase of 188,030 tons against an increase for September of 175,535 tons, for August of 530,442 tons, and an increase for July and June of 685,506 and 610,545 tons respectively. The unfilled orders a year ago were 8,353,293, or 1,880,625 tons more. The table below gives the unfilled tonnage for the Steel Corporation at the close of each month beginning with January, 1916:

	1919	1918	1917	1916
January	6,684,268	9,477,853	11,474,054	7,922,767
February	6,010,787	9,288,453	11,576,697	8,568,906
March	5,430,572	9,056,404	11,711,644	9,331,001
April	4,800,085	8,741,882	12,183,083	9,829,551
May	4,282,310	8,337,623	11,886,591	9,937,798
June	4,892,855	8,918,866	11,383,287	9,640,458
July	5,578,061	8,883,801	10,844,164	9,593,592
August	6,109,103	8,759,042	10,407,049	9,660,357
September	6,284,638	8,297,905	9,833,477	9,522,584
October	6,472,668	8,353,293	9,009,675	10,015,260
November	.....	8,124,063	8,897,106	11,058,542
December	.....	7,379,152	9,381,718	11,547,286

The largest total of unfilled orders was on April 30, 1917, when it was 12,183,083 tons; the lowest was on Dec. 31, 1910, when the total was 2,605,747 tons.

ESTABLISHED 1855

THE IRON AGE

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End of the Printers' Strike

The strike of pressmen, compositors and other employees of publishing houses in New York, which prevented the publication of about 250 periodicals in that city for two months, was fought to a finish. The publishers won their fight, which was for two great principles: the integrity of contracts and the arbitration of differences between employers and employees as to wages and hours of labor. The strike started with the violation of contracts and ended when the strikers returned as ordered by their international officers, who, to their credit be it said, throughout the strike period insisted upon the strict observance of all contracts with the publishers. Work was resumed, with the international unions still pledged to stand for the doctrine that a contract is a bond of honor.

The strike was very costly in money lost by employers and employees and in unproductive expenditure of effort and nervous force, while millions of subscribers and advertisers sustained losses as real as those of the immediate parties to the controversy, although in many cases not so clearly apparent. But the fight was worth all it cost, if, as we believe is true, it has established on a much stronger foundation the principle of steadfastly living up to contracts.

The question as to contracts having been settled, the next act was to carry out the plan which had been insisted upon by the publishers and by the international officers of the unions even before the strike was started—that of arbitrating differences relating to hours and wages. This presents no serious difficulties, and the work of arbitration is now under way. It is confidently expected that the decision of the arbitrators will soon be announced and promptly accepted by both sides.

It would be a waste of time to go into a narration of the factional disputes of the various groups of employees, which have been an outstanding feature of the strike. Our readers are not interested in the details of our troubles, but are vitally concerned in the maintenance of the principles for which we have been fighting. They have given abundant evidence of their interest and good will and we wish to express in the heartiest manner possible our appreciation of all they have said and done during these trying times.

The strike has bound THE IRON AGE to its friends more firmly than ever, and their assurances have made us more anxious to serve the great iron, steel and machinery trades to the utmost of our ability.

One final word: We have come to the end of the strike without bitterness toward the men who went on strike, many of whom were misled. Our earnest desire is to be just to our employees and to bring them into closer relations with us.

War Effects on Industry

During the war, and particularly during its first two years, the opinion was often expressed that industrial depression would follow. There seemed to be an idea that thus the people would "pay" for the war, for its great destruction of material things. THE IRON AGE of Jan. 4, 1917, contained an article discussing commercial conditions during and after two wars, with graphs of seven important trade movements in the United States, France and Great Britain, from the beginning of our Civil War through the Franco-Prussian War and to the end of 1875. It was shown clearly that there was an unusual degree of activity, until 1873 in the case of the United States, and perhaps for a somewhat longer period in the case of Great Britain and France. It was not asserted in the article that the activity was a result of the two wars, the conservative statement being made that the facts were cited to show that great industrial activity was possible after wars. Thus the idea that the war would necessitate an industrial depression was positively controverted.

From most viewpoints the industrial depression that ran in the United States from late in 1873 to some time in 1878 or the early part of 1879 was the most severe the country ever knew. Little investigation is required to ascertain the principal direct cause of that depression. It was an excess of construction work, with the attendant circumstance of prices being high. Workmen were very largely engaged in construction work, including railroad building, and when such work ceased a great many were thrown out of employment.

In the retrospect it is easy to see that the inflation and the over-activity in construction work, while the cause of the industrial depression, were in turn results of the war, though not necessary results. If men had had better judgment, if they had kept their heads, after the war the inflation

and unwarranted expansion would not have occurred. It is quite certain that the United States did not "pay" for the Civil War in the years from 1873 to 1878. If there was destruction to be equalized by construction, it was not when men were idle during the depression that the work was done. Even in the narrow sense of paying off the national debt little was done, for the decrease in the national debt in the six years from July 1, 1873, to July 1, 1879, was only $109,000,000, against $403,000,000 decrease in the six years preceding and $621,000,000 in the six years following.

The experience of our Civil War, therefore, indicates that the industrial depression connected with it was not in payment for the war, but in payment for the excesses committed after the war and prompted by the mental viewpoint the ending of the war had produced.

With the knowledge gained late in the recent war and since, it becomes apparent that the industrial debt or setback occasioned by the world war was not, in the main, one that must be definitely paid at one time or another after the war. In very large part the payment has already been made in the failure of the world to progress in material things. The world has not built railroads and factories as it would have done had there been no war. That is the main part of the setback. Time was lost, and no nation undertakes to make up that lost time.

It is quite certain that the money cost of the war, somewhat over a quarter trillion dollars, is by no means the measure of what was lost, wasted, or dissipated. Goods were bought at very high prices, for one thing, while for another taxes were collected from profits made in connection with the receipt of some of the money spent by the governments. Then there is a considerable amount of salvage after the war expenditures, while again many men worked harder and produced more than they would have done otherwise, and that represented a direct saving.

As to industry, then, the chief point is whether it is disposed to make up for time lost by the war, in now recording more rapid progress. As long as men do not want to work hard this cannot be done; but from the long range viewpoint there is no rule requiring us to make a certain amount of progress each year. If we do not want to make the effort we have to do without the progress. We shall make such progress as collectively we desire to make.

Sellers of Bessemer ferrosilicon and silvery irons have had no difficulty in advancing quotations on their products in harmony with the recent advances of foundry iron. Much basic iron is being substituted for foundry iron nowadays, while low silicon foundry irons are being mixed with high silicon silveries, all of which contributes to the advancing tendency of the prices for these grades. Many consumers have found it necessary to resort to the use of large quantities of scrap and this has caused an increase in the consumption of iron running from 6 per cent to 9 per cent in silicon. Several furnaces making high silicon iron, which have been idle for a long time on account of strikes, will now, when the strikes are ended, be unable to ship against contracts until very late in the year, because it will be necessary to reline the stacks before they are blown in. The outlook is that the production of silvery irons will be largely increased about Jan. 1, but in the meantime the scarcity and advancing prices will be continuing factors in the market.

Progress in Electric Steel

Expansion in the American electric steel industry and that of the world in 1918 was noteworthy. According to statistics of the American Iron and Steel Institute, the 1918 production of electric ingots and castings in this country was 511,364 gross tons as compared with 304,543 tons in 1917. It was roundly 17 times the 1913 output of 30,180 tons. About 80 per cent of the 1918 total, or 403,068 tons was ingots and this was more than three times the ingot output in 1916 and 20 times that of 1913.

The increase in electric steel castings was also large. The 1918 output was 108,296 tons, or a little more than the total of both 1917 and 1916, the 1917 output having been 64,911 tons. There was nearly 1100 per cent increase last year over the steel casting output of electric furnaces in 1913, which was only 9,207 tons. It would appear that the electric furnace has further replaced the crucible process. In 1917 the crucible output of ingots and castings was about 30 per cent of the total while in 1918 it was only about 20 per cent.

Alloy steels made in electric furnaces continue to be a prominent feature. Over 55 per cent of the total electric production last year, or 290,961 tons out of 511,364 tons, was electric alloy steel. The large war demand for ordnance ingots explains this in part. Only 3076 tons of the 1918 total was electric alloy castings.

From a study of the statistics of eight of the leading electric steel producing countries it is found that the total of their outputs of electric steel, with only two estimated, was a little over 1,155,000 tons in 1918. The United States leads with its 511,364 tons and Germany is second with 221,800 tons. Great Britain ranks third with 148,000 tons and Canada fourth with over 120,000 tons. France produced 58,000 tons, or more than three times its 1913 output.

It is safe to say that the 1919 output of electric furnaces in the United States and in all countries will not equal the record of last year. In 1918 there was the stimulus of war needs, as well as the unparalleled supply of steel borings. In England some producers have been offering their electric melting equipment for sale and a number of furnaces there have been shut down. In the United States, however, this industry, without doubt, has come to stay, and the amount of building for purely war purposes was not large. A loss here and there will probably be balanced by gains. Already in the steel foundry industry same producers of electric castings are competing successfully with the converter or the small open-hearth.

America is consecrated to improvement. That is why America has been the economic as well as political hope of mankind for over a century.

Pyrometry and Steel Making

The strides made in recent years in the science of measuring temperatures were strongly emphasized at the Chicago meeting of the American Institute of Mining and Metallurgical Engineers. No fewer than sixty papers on pyrometry were scheduled. Of these, fifty-three were assigned to a symposium on pyrometry, taking up an all-day session, while seven were devoted to the subject as related directly to the iron and steel industry.

It is unusual in the annals of technical conventions that as many as fifty-three papers have been called out in the consideration of a single subject. It is interesting that of this total, thirty-five were presented by the authors themselves, while the attendance of both morning and afternoon sessions was surprisingly large. It is questionable, as we have intimated in previous comment, whether much is gained by such an overwhelming outpouring of contributions. Proper assimilation is doubtful, nor is there the chance for adequate and fruitful discussion. So many papers, however, draw attention to the interest in pyrometry and to the great advance it has made. The contributers covered almost every industry in which pyrometers are or can be used, from the kinds of instruments and their various parts down through the industries, steel and ceramic, and even to the temperature of a burning cigar. The papers are a testimonial to the excellent work of the United States Bureau of Standards and the National Research Council, many of the authors being connected with the Bureau.

In the session on pyrometry, with reference to iron and steel metallurgy, it developed that definite progress has been made in devising methods and apparatus for ascertaining the actual temperature of the steel bath. The importance of this may be realized by the fact that proper pouring of steel at proper temperature is almost as essential as some of the subsequent operations in the manufacture of the steel, and that, when the suitable thermal furnace and pouring conditions are ascertained, as they now bid fair to be, an improvement in the final product will be more certain.

Simplifying a Housing Problem

Owners of industrial plants who are considering the housing problem in connection with the welfare of their employees are leaning more and more toward the idea that the best results cannot be obtained by creating communities of houses inhabited chiefly by workers of one establishment, but rather by a scattering of homes through the community. It is felt that the latter plan leads to a broader contact with people than where home neighbors work side by side day after day in the same shop.

Along this line of reasoning the plan of a company at Worcester, Mass., is of unusual interest. The company would assist its workers to build homes of their own and has set aside a substantial sum for the purpose. A Worcester housing corporation, officered and financed by a group of manufacturers, has started the building of a number of groups of two and three-family houses, mostly of the latter class, totaling as a starter 65 buildings having some 190 apartments.

The company mentioned proposes to start an employee in his building project on the payment by him of only 5 per cent of the cost of the property. The housing corporation cannot afford to be so generous as this; it must receive a considerably larger initial cash payment. However, under an agreement with the manufacturing company the corporation will build the house for the employee in one of its neighborhoods, a savings bank will take a first mortgage of 65 per cent of the valuation, and the employing company will finance the remainder. The employee will pay down as much cash as he can afford, down to the 5 per cent minimum, if necessary, and the company will pay the rest of the 35 per cent, taking a second mortgage for the amount from the employee. Under this plan, with a three-family house or with a two-family house, the rent received, including that of the owner if he occupies one of the apartments, will take care of interest, taxes, repairs, insurance, etc., and pay each year a substantial sum toward reducing the principal of the second mortgage. The owner is assured a house superior to any he could build as an individual for the same amount of money, for by building in lots of houses the housing corporation saves a good deal of cost. The manufacturing company will do just what it would do were it to finance the transaction directly with the worker, if the latter were building for himself, but does it in a more efficient way.

In an editorial in THE IRON AGE, Nov. 27, a sentence in the first paragraph was incorrectly printed so as to conclude, "before the American Electrochemical Society and the Exposition of Chemical Industries, a session on pyrometry alone, lasting a whole day, had an array of 53 papers." The concluding words, "a session on pyrometry, etc." were originally written as an independent sentence, which would have credited this important session to the American Institute of Mining and Metallurgical Engineers, as was intended. It is interesting to add that this symposium of papers is to be published by the institute in a volume of 750 pages.

Profit Sharing Investigation

George W. Perkins, chairman of the department of profit sharing, National Civic Federation, New York, is making an investigation of profit sharing systems. The report on profit sharing published by the federation in 1916 contained an analysis of more than 200 plans then in operation. There is an active demand for the report, which is now out of print, and it is proposed to publish a revised edition containing the additional information which Mr. Perkins is collecting. Circulars addressed to manufacturers ask, among other questions, the following:

The date of the installation of your plan; and, if not in force, when discontinued, and why.

What is your average number of employees at this time and how many participate in the plan?

What is the feeling toward the plan by those for whose benefit it was intended?

Has your profit-sharing plan been the means of modifying the tendency toward labor troubles?

Is it limited to heads of departments or does it include the rank and file?

Is it regarded unqualifiedly as a success? If not, where has it failed to accomplish your aim?

"The Cupola" is the title of a monthly bulletin, instituted with the September number, and published in the interests of the employees of the Iron Products Corporation, 90 West Street, New York. This concern is a merger of the Essex Foundry, Newark, and the Central Foundry Co. and its subsidiary companies, New York.

BLAST FURNACES MUST STOP

Coal for Beehive and By-Product Ovens Cut 50 Per Cent

WASHINGTON, Dec. 9.—The steel industry has been put on a three days a week basis by the Fuel Administration. Beehive and by-product coke production has been cut 50 per cent. Despite the expectation of the settlement of the coal strike, the Fuel Administration and the Railroad Administration have decided to take no chances, particularly as the nearness of the holidays will in any event prevent normal production before January.

"A careful survey of the coal situation," says the announcement of the Fuel Administration, "indicates that even if there is a prompt settlement of the coal strike it will take some time to adjust the country to a normal basis, and that therefore certain restrictions will have to be placed on the consumption of bituminous coal and of light, heat and power derived therefrom, so that urgent domestic needs may be cared for, the necessary foodstuffs produced and really essential light, power and heat supplied."

Stringent restrictions in the consumption of heat, light, power and fuel by all classes of industries have been announced. No manufacturing plant may operate in excess of three days a week on the basis of the present working hours except dairies, refrigerating plants, bakeries, plants for the manufacture of necessary food products or necessary medicinal products, water works, sewerage plants, printing plants for the printing of newspapers only, battery charging outfits in connection with plants producing light or power for telephone, telegraph or public utility companies.

The restriction, however, applies to practically the entire steel industry and the order also practically abolishes the preferential list. The order does not restrict the use of coal from private stocks which do not require transportation. The 25 per cent restriction on coke announced last week has proved insufficient. For that reason both beehive and by-product coke are put on a 50 per cent basis, the Fuel Administration requiring that one-half the coal normally used by the ovens be diverted to general use. The basis of the restriction is the consumption during the last ten days of November. From the beehive ovens alone this would mean a diversion of 100,000 tons a day.

Beehive Ovens Making Good Record—Time Needed to Readjust Conditions

WASHINGTON, Dec. 9.—Although Government officials are optimistic concerning the outcome of to-day's coal conference at Indianapolis, it will require more than a month to re-establish the normal coal conditions, even though the strike be ended at once. The situation is complicated by the fact that the Railroad Administration has diverted a large proportion of its rolling stock to the Middle and Far West, carrying coal to those centers. It must now hurry these cars back to the mines before full resumption is possible. There is also great doubt as to the speed with which it will be possible to put the miners back into the pits.

One of the latest acts of the Fuel Administration is the restoration of the war-time limitations on coke prices. Several weeks ago the Railroad Administration was empowered to divert coal from the beehive ovens, in the way in which it has been diverting other coal. This was followed by order permitting the beehive ovens to coke 75 per cent of their normal consumption of coal. Later this order was changed, giving all coke ovens only 50 per cent of their normal coal shipments.

War-Time Prices

The order of the Fuel Administration re-establishing the war-time coke prices took effect after the formal revocation of the order of January 31, 1919, which had suspended the orders "fixing or regulating the price of beehive coke, or fixing or regulating the margins or commissions of middlemen or wholesale or retail dealers in beehive or by-product coke."

The base maximum prices for beehive coke thus restricted follows:

Blast furnace or smelting coke, $6; 72-hr. selected foundry coke, $7; screened above ¾-in., $7.30; screened below ¾-in., $5; breeze, $3.

The base maximum prices on by-product coke follow: Run of oven, $6; selected foundry, $7; screened above ¾-in., $6.50; screened below ¾-in., $5; breeze, $3.

The delivered prices are formed by adding the freight rates.

At the same time, the Fuel Administrator has authorized the Railroad Administration to divert beehive or by-product coke in transit just as bituminous coal has already been diverted.

The statistics of the Geological Survey show that the rate of production on the working days of the fourth week of the strike, Nov. 23-29, was 48.3 per cent of normal. During the first week it had been 29.6 per cent of normal; during the second, 33.3, and during the third, 44.5 per cent. The total output during the month of November was 18,815,000 tons.

The production of beehive coke continued to increase rapidly during the week ended Nov. 29. The total output is estimated at 449,000 tons, the highest attained in any week since last February, with the single exception of the week of Sept. 20, immediately before the steel strike. In the preceding week it was 402,000 tons. In the week ending Nov. 30, 1918, it aggregated 522,000 tons.

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BRITISH STEEL CONDITIONS

Markets Very Active—Pig Iron for Export Scarce—Steel Companies Overwhelmed With Orders

LONDON, ENGLAND, Nov. 24.—Great activity prevails in the iron and steel trade. Unfortunately one thing after another appears to prevent full advantage being taken of all the business that is offered. First, production is curtailed through shorter hours and lack of sufficient skilled labor to make a compensating increase in working forces, while one of the serious difficulties of the whole industrial situation is the shortage of cars. In addition, there is the molders' strike. So far no settlement has been reached. Meanwhile, however, the molders in Scotland (who have not hitherto been affected) propose to join the strikers on Nov. 26.

There is but little if any improvement in the supply of foundry grades of Cleveland pig iron. This is regrettable, as under an Order in Council of Nov. 21 pig iron may in future be exported freely without license. Licenses are still necessary for the export of scrap iron, however. Much business might be done with overseas markets if the pig iron were available. As it is there is less than enough for home consumers, and buyers in Scotland have been taking forge iron owing to the difficulty of getting foundry. Plenty of forge iron is obtainable, but the price is firmer and quoted at about the same price as No. 3 Cleveland. So far as East Coast hematite is concerned the position has been improved by some good business which has been placed recently, while there is a continued inquiry from the Continent. Supplies at present, however, are quite sufficient.

In steel, prices are firm and the inquiry excellent, the chief difficulty still being to get orders accepted. India has been buying and export business generally has increased considerably. Work was resumed a week ago at the steel works in the west of Scotland. The bricklayers who had been on strike there for about six weeks or so decided to return to work, provided none of the strikers were victimized, and on the promise that the wages question would be discussed within the next seven days.

It is reported that the shareholders of the Low Moor Co. have received notice of general meetings to consider proposals for changing the name of the company and increasing the capital for the purpose of acquiring the old established business of Robert Heath & Co., Ltd., in North Staffordshire. The companies are both engaged in similar work, owning collieries, blast and puddling furnaces, rolling mills, etc. The Low Moor Co. own modern coke ovens and by-product plants, and Robert Heath & Co. have a large holding in a separate colliery undertaking with an extensive and modern coke oven and by-product plant.

It is also reported that Messrs. Vickers have recently acquired an interest in the Swiss electrical engineering firm of Brown, Boveri & Co. Another development of interest is the acquisition of a controlling interest by Messrs. John Lysaght, Ltd., in Messrs. Joseph Sankey & Sons for between £400,000 and £500,000. Messrs. Sankey's business was established 47 years ago, and its specialties include the rolling of high qualities of steel sheets, stamping for the electrical and engineering trade, the manufacture of hardware and enamel ware, motor accessories and steel motor wheels.

Another announcement of interest is that the English Electrical Co. has bought the Siemens Works at Stafford. This marks a further important stage of development in the policy of the English Electrical Co., which represents the consolidation of the interests of Dick Kerr, the Coventry Ordnance Works, Willans & Robertson, and the Phoenix Dynamo. A working agreement has been entered into between the English Electrical Co. and Messrs. Siemens Bros. & Co. providing for the preferential exchange of the special products of each. It is reported that £1,000,000 worth of stock in the Dominion Steel Corporation has been purchased by Colonel Grant Morden, M.P., for £700,000. The associates of Colonel Morden in the deal include Viscount Furness, Sir William Beardmore, Sir Trevor Dawson, vice-chairman of Messrs. Vickers, Ltd.; Sir Harry McGowan, managing director of Messrs. Nobel's Explosives Co.; Benjamin Talbot, managing director of the Cargo Fleet Iron Co. and the South Durham Steel Co., and Henry Steel, a director of the Bengal Iron and Steel Co. It is stated that this new holding with the shares previously acquired by Colonel Morden will give him control of the company.

The position of the foreign ore trade is stagnant. Consumers have sufficient stocks to go on with, while they are also believed to have heavy arrears still to come in against contracts. The quotation stands at about 52s 6d for best Bilbao rubio of 50 per cent quality ex-ship Tees based on a 24s. freight from Bilbao. Apparently the members of the consumers' buying syndicate are awaiting the start of operations by their own agents before doing anything.

The enormous amount of work on the books of the motor car manufacturers has been well illustrated recently. The motor show held in London has attracted an enormous amount of interest. Buyers are realizing that it is impossible to obtain quick delivery of British made motors and are putting their names down on waiting lists which already in some cases extend to 1921. Several companies have disposed of their possible output for more than two years ahead.

Buyers at Youngstown Find It Difficult to Place Orders

YOUNGSTOWN, OHIO, Dec. 9.—As a natural consequence of interrupted operating schedules and diminished output, Valley steel companies are far behind in deliveries and are continuing their policy of refusing to take on additional business. Rollings are booked well over the first quarter of 1920 and sales departments are disinclined to consider new business in volume until the uncertainty incident to the coal strike is past. Dealers, jobbers and domestic consumers in general offer handsome premiums for spot delivery, which is practically an impossibility. The principal independents are continuing the policy which they adopted during the war of supplying the regular trade first and there is no deviation from this rule.

With diminished ingot production during the past 11 weeks sheet bars have become scarce and are now commanding from $47 to $51 per ton. It is doubtful if any sheet bars can be purchased in this locality for less than $51. With output sold over the first quarter and possibly longer, depending on the extent of production during rest of the year, consumers will find difficulty in making any bookings.

A similar condition exists in the sheet steel trade. Though mills are sold through March in most cases, heavy demands are coming in from the motor industry and from fabricators. Buyers are still offering premiums with their inquiries for stated delivery, many proffering $15 a ton for blue annealed and galvanized, light gage. Sheet mill by-products, such as washers, galvanized seconds and pickled seconds, command a ready sale.

No tonnages of tin plate are available in the Valley, the Trumbull Steel Co., the principal maker, having closed its books. Meat packers and canneries are inquiring for heavy lots. Export buyers are offering $8 per base box.

Plate mill schedules are being maintained with more regularity than other departments, with plenty of business being taken.

Heavy melting scrap is quoted at $21 by a leading dealer, who reports business stagnant due to uncertainties of steel plant operations.

The Bath Machine Works Co. property, Bath, N. Y., which has not been operated for some time, has been purchased by H. R. Hood, of Corning and Rochester, N. Y. The plant, with equipment, was valued at $100,000.

Iron and Steel Markets

A SERIOUS CURTAILMENT

New Fuel Order Means Many Shutdowns

Coal for Coking Cut 50 Per Cent—Resumption of Mining Means Only Gradual Relief

The iron trade is face to face with a much more serious shortage than that which has been a matter of concern for weeks. Even though work be resumed promptly at bituminous coal mines as the result of the Indianapolis conference, restrictions on the distribution and use of such fuel are likely to continue for weeks and their removal will be only by degrees.

Under the latest restrictive order of the Fuel Administration, effective Wednesday, Dec. 10, beehive coke ovens are limited to 50 per cent of the coal charged into them in November and by-product ovens are put on 30 hours' coking time, practically cutting their output by 50 per cent. Ten days enforcement of this order would cause nearly half the blast furnaces of the country to bank or blow out.

With the added possibility of snow blockades, the outlook for iron and steel production in the next two months is thus more serious than at any time, not excepting the shut-down period covered by the famous Garfield order of Jan. 17, 1918. That was war time, and blast furnaces and steel plants were allowed all the fuel the crippled railroads could haul to them. Pig iron output is now at the rate of about 84,000 tons a day, but is likely soon to fall much below the average of 78,000 tons a day made in the heatless January of 1918.

It took a sharp flurry in the coke market last week to bring into play an order from Washington restoring war-time prices, which were $6 at oven for blast furnace coke and $7 for foundry coke. When the 25 per cent reduction in coal supply for beehive ovens was made, effective Dec. 1, there was a scramble to get blast furnace and foundry coke. While very little could be had, the price for spot furnace coke rapidly advanced and as high as $12 was done, while foundry coke sold up to $15.

Thus far, iron and steel producing plants seem to have been hurt more than those of consumers. At Gary, Ind., eight blast furnaces are active and four are out. At South Chicago five are in and six idle. A Canton, Ohio, furnace has stopped and two more in eastern Pennsylvania. Some open-hearth plants are turning to oil to help out.

In the Pittsburgh district sheet and tin plate operations are much restricted. The American Sheet & Tin Plate Co., which has closed 70 hot sheet and tin mills in Indiana, has 46 hot mills idle in western Pennsylvania. An independent plant at Canonsburg, Pa., is shut down. At Youngstown the week opened with a very sharp curtailment at the plants of four independent steel companies. In all iron and steel operations the using up of reserve coal means a constant liability to shutdowns through the winter.

Rapid advance of pig iron prices continues. In the Pittsburgh district, foundry iron has sold at $36, Valley, an advance of $3.50 in a week, while steel-making irons have advanced at least $1 and much higher prices are being asked in Cleveland and other centers. Virginia and eastern Pennsylvania quotations are also higher and Alabama iron is on a basis of $35, furnace, with very little obtainable. A melter of basic near Cincinnati is in the market for 5000 tons and would buy 10,000. Another inquiry is for 3000 to 5000 tons a month up to July 1.

Steel makers are more set in their refusal of new business, in the more serious turn of the fuel situation. Some sheet and tin plate interests are tied up for the first half of next year, and deliveries on export tin plates are much in arrears. The policy of the Steel Corporation in sticking to March 21 prices is maintained. In the wire trade, in particular, the difference between that basis and the prices realized in various reported sales is widening. All the larger producers in nearly all lines are refusing the premiums currently offered.

The tonnage of export orders booked in November scarcely bears out the common report that American steel makers have withdrawn from foreign markets. There is still a considerable sale of plates to England, and at Pittsburgh 12,000 tons of plates have been booked, which go into tanks for Japan. Belgian rolling mills, which once depended on Luxemburg for semi-finished steel, will be drawing on the United States for billets for some months to come. But in general the coal strike has made a serious inroad on export shipments of steel.

Tentative rail orders that are coming on the books at Chicago now amount to 400,000 tons and represent six months operations for the rail mill in that district.

The hearing by the Federal Trade Commission on the Pittsburgh basing point controversy was short, as it involved only the question of jurisdiction. In view of the great mass of briefs, no early decision is looked for. The complainants did not ask for a Chicago base price but asked that an end be put to the practice of making the freight from Pittsburgh a factor in the calculation of prices by Chicago district mills. Producers having plants in both the Pittsburgh and Chicago districts are particularly aimed at.

Pittsburgh

PITTSBURGH, Dec. 9.

Interest is centered on the action to be taken at the coal conference in Indianapolis, to be held to-day. The Fuel Administration has put prices on coke, effective from Dec. 8, back to the war prices, which were $6 for prompt and future furnace coke, $7 for prompt and future foundry coke per net ton at oven, and these are the prices now in effect on coke. In this connection it is understood that contracts for furnace and foundry coke, no matter what the basis, made prior to Dec. 8, will not be disturbed.

The shortage in supply of coal has already closed a number of plants, and others will go down this week. The American Sheet & Tin Plate Co. has closed its Mercer, Pa., works, eight hot sheet mills, its Pittsburgh tin-plate works at New Kensington, Pa., eight hot tin mills, its Gary, Ind., works, 22 hot sheet mills and

28 single hot-tin mills, also its American works at Elwood, Ind., 20 hot-tin mills and its Farrell, Pa., works, 30 hot-tin mills. The Standard Tin Plate Co. has closed its tin-plate works at Canonsburg, Pa., having 23 hot-tin mills, because of the coal strike. The Carnegie Steel Co. has no plants down as yet, and is said to have enough coal to last over the first of the year. The Jones & Laughlin Steel Co. has no plants down, but has been drawing for some time on a reserve stock of coal stored on Neville Island, the coal being towed on barges to its Aliquippa, Pa., works, and to its mills on tht South Side, Pittsburgh. Steel companies in the Pittsburgh district are pretty well fixed for coal until after the first of the year.

Curtailment in practically all departments of the plants of the Youngstown Sheet & Tube Co. was announced last night by President James A. Campbell because of coal shortage. No department has been completely suspended, and it is hoped to operate on a restricted schedule throughout the week. The Hazelton and Lowellville works of the Sharon Steel Hoop Co. failed to resume Monday. Both the Brier Hill Steel Co. and Republic Iron & Steel Co. opened the week with little coal on hand. The belief is that the end of this week will see the coal strike settled, but it may be the first of the year before normal output of coal is reached.

Pig Iron.—The local pig iron market continues active, but inquiry for Bessemer and basic has quieted down to some extent. Foundry iron is active in demand, and has sold at $36 Valley furnace for first quarter. Sales of malleable for first quarter have been made at $35 and $36, and of gray forge at $35, Valley furnace. We note sales of 800 tons, 1500 tons and 2000 tons of No. 2 foundry for first quarter at $36, 3000 tons of Bessemer, equal shipments over first half, at $35, and 2000 tons of basic for first quarter at $34, Valley furnace. We quote standard Bessemer iron at $35, with reports of sales of $36 to $38; basic, $34; malleable, $35; No. 2 Foundry, $36; No. 1, $37.25; No. 3, $35.50, and gray forge, $35, all at Valley furnace. The freight rate to Pittsburgh or Cleveland districts is $1.40 per ton.

Ferroalloys.—Another advance of $2 to $2.50 on the lower grades of Bessemer ferrosilicon and also on silvery iron has been made, and sales for first half of both Bessemer ferrosilicon and silvery iron ore reported at the new prices. Sales of about 200 tons of domestic ferromanganese are reported at $120 delivered.

Finished Material.—The demand for finished iron and steel of all kinds is extremely heavy, and far beyond the capacity of the mills to supply. Premiums over regular prices are becoming more common, but most of the large steel companies are turning down tenders of new business at premium prices, saying they have nothing to sell. Firm offers of as high as $10 per keg base have been made for wire nails and premiums of $20 or more have been offered recently for sheets by automobile builders. Several local steel companies are refusing to enter any more orders on their books until the coal strike is settled.

Shapes and Plates.—Inquiry for fabricated work is heavy. The McClintic-Marshall Co. has taken 4000 tons for extensions to machine shops of the Westinghouse Electric & Mfg. Co. at Essington, Pa., now known as Lester, 400 tons for extensions to a power house of the Goodyear Rubber Co., Akron, Ohio, and 300 tons for a new building for the Philadelphia Paper Mfg. Co. The American Sheet & Tin Plate Co. has been allocating its output of sheets and tin plate since it started to sell for next year, and, with what sheets and tin plate it will carry over into next year, is practically sold up for first half. Some of the independent sheet and tin plate mills are selling sheets and tin plate for first half at the March 21 prices, while others are so far refusing to sell, claiming they have practically no sheets or tin plate to offer for first quarter delivery.

Wire Products.—All kinds of heavy premiums in prices for wire nails are being offered by jobbers and consumers, but local mills are sold up and are refusing all tenders of this business. It is stated one mill has taken a contract for 4000 to 6000 kegs of wire nails for first quarter at about $6 at mill.

Tubular Products.—The demand for line pipe and oil well tubular goods is as heavy as ever. A large oil interest placed last week about 400 miles of 8-in. pipe for delivery in first quarter. About half was taken by the leading interest, and the remainder was divided among two or three mills. Another inquiry is in the market for 1400 miles of 8-in. pipe, still another for 750 to 800 miles, and almost innumerable smaller orders are being offered to the mills, which are turning them away.

Coke.—The Fuel Administration has fixed prices on coke on the basis in effect during the war, which were $6 for prompt and future furnace coke and $7 for prompt and future foundry coke, effective from Dec. 8. Before these prices were fixed by the Government a local coke interest had sold upward of 25,000 tons of standard furnace coke per month for first half of next year, on the basis of $5 per ton for coke when basic iron is $24 at Valley furnace, and for each advance of $1 per ton on basic iron the coke is to go up 25c. per ton. The contract carries a minimum price of $5 and a maximum price of $8.50 per net ton at oven for the coke and prices quoted each week in THE IRON AGE on basic iron are to govern settlements. We now quote prompt and future standard furnace coke at $6, and prompt and future foundry at $7 per net ton at oven. Late last week standard furnace coke for spot shipment sold at $9 and as high as $10 per net ton at oven. The Government then stepped in and fixed the war prices.

Old Material.—The demand for iron and steel scrap is heavy, but dealers are not anxious to sell, believing that prices on all grades of scrap will go higher. However, the coal strike has slowed down operations of the steel mills, and prices on all grades of scrap are practically the same this week as last.

Philadelphia

PHILADELPHIA, Dec. 9.

Pig Iron.—Foundry iron is in scant supply for early delivery and prices are higher. Eastern Pennsylvania furnaces have obtained $39, furnace, for No. 2 plain (1.75 to 2.25 per cent silicon) and $40, furnace, for No. 2 X (2.25 to 2.75 per cent silicon). A Virginia furnace has sold 13,000 tons of foundry iron, some of it at $39, furnace, or $43.10, delivered Philadelphia, and then the price was advanced to $40, furnace. This interest could easily have sold two or three times the tonnage it had on hand at the same high prices. The order of the Fuel Administration, issued to-day, restricting the production of coke to 50 per cent, and placing all so-called unessential industry upon a three-day a week operating basis cannot fail to cut down pig iron output if it is continued in effect for long. While blast furnaces cannot, of course, operate on a three-day week, it is altogether likely that the reduced output of coke will result in some furnaces being forced to bank. Practically all of the furnaces are now out of the market, and will do no further selling until the fuel situation is once more on a normal basis. There is no inquiry for basic iron, but business could not be negotiated below $35 to $36 or possibly more. Malleable iron has sold at $39.60, delivered Philadelphia; 1000 tons of standard low phosphorus iron has been sold at $45, furnace, and makers of copper bearing iron are not willing to sell at less than $40, furnace.

Ferroalloys.—Sales of domestic ferromanganese have been made during the past week at $120, delivered. One British agent has sold at $110, seaboard, for first quarter delivery, but is now out of the market, and another British agent is selling the imported alloy for second quarter at the same price. There is an inquiry in the market for 2000 tons of ferromanganese for first quarter. Spiegeleisen has sold in carload lots at $35, furnace. A maker has asked $40, furnace, for spiegeleisen analyzing 22 per cent or better.

Semi-Finished Steel.—Open-hearth rerolling billets have been sold by Eastern makers at $50, Pittsburgh.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Dec. 9, 1919	Dec. 2, 1919	Nov. 11, 1919	Dec. 10, 1918
No. 2 X, Philadelphia‡	**$40.10**	$38.10	$36.10	$39.15
No. 2, Valley furnace†	**36.00**	32.50	32.00	34.00
No. 2 Southern, Cin'ti†	**38.60**	37.60	33.60	37.60
No. 2, Birmingham, Ala.	**35.00**	34.00	30.00	34.00
No. 2, furnace, Chicago*	**40.00**	35.00	30.00	34.00
Basic, del'd, eastern Pa.	**35.00**	32.00	31.00	36.90
Basic, Valley furnace	**34.00**	33.00	27.50	33.00
Bessemer, Pittsburgh	**36.40**	35.40	29.90	36.60
Malleable, Chicago*	**40.50**	35.50	30.50	34.50
Malleable, Valley	**35.00**	33.00	31.00	34.50
Gray forge, Pittsburgh	**36.40**	33.40	29.90	34.40
L. S. charcoal, Chicago	42.50	42.50	41.50	38.85

Rails, Billets, Etc., Per Gross Ton:				
Bess. rails, heavy, at mill	**$45.00**	$45.00	$45.00	$55.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh	**45.00**	43.00	42.00	47.50
O.-h. billets, Pittsburgh	**45.00**	43.00	42.00	47.50
O.-h. sheet bars, P'gh	**48.00**	46.00	45.00	51.00
Forging billets base, P'gh.	60.00	60.00	57.00	60.00
O.-h. billets, Phila	**54.00**	48.00	47.50	51.50
Wire rods, Pittsburgh	**60.00**	58.00	55.00	57.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	3.245	3.245	2.995	3.745
Iron bars, Pittsburgh	3.25	3.25	3.00	3.50
Iron bars, Chicago	2.77	2.77	2.72	3.50
Steel bars, Pittsburgh	2.75	2.75	2.75	2.90
Steel bars, New York	3.12	3.12	3.02	3.17
Tank plates, Pittsburgh	2.65	2.65	2.65	3.25
Tank plates, New York	2.92	2.92	2.92	3.52
Beams, etc., Pittsburgh	2.45	2.45	2.45	3.00
Beams, etc., New York	2.72	2.72	2.72	3.27
Skelp, grooved steel, P'gh.	2.45	2.45	2.45	2.90
Skelp, sheared steel, P'gh.	2.65	2.65	2.65	3.25
Steel hoops, Pittsburgh	3.25	3.25	3.25	3.50

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Dec. 9, 1919 Cents	Dec. 2, 1919 Cents	Nov. 11, 1919 Cents	Dec. 10, 1918 Cents
Sheets, black, No. 28, P'gh.	4.35	4.35	4.35	5.00
Sheets, galv., No. 28, P'gh.	5.70	5.70	5.70	6.25
Wire nails, Pittsburgh	**4.00**	3.50	3.50	3.50
Plain wire, Pittsburgh	**3.25**	3.10	3.10	3.25
Barbed wire, galv., P'gh.	**4.45**	4.25	4.25	4.35
Tin plate, 100-lb. box, P'gh	$7.00	$7.00	$7.00	$7.75

Old Material, Per Gross Ton:				
Carwheels, Chicago	**$30.00**	$30.00	$25.50	$27.00
Carwheels, Philadelphia	30.00	30.00	28.00	29.00
Heavy steel scrap, P'gh.	**24.00**	23.00	22.00	26.00
Heavy steel scrap, Phila.	22.50	22.50	20.50	26.00
Heavy steel scrap, Ch'go.	20.50	20.50	18.00	26.00
No. 1 cast, Pittsburgh	**30.00**	28.00	27.00	27.00
No. 1 cast, Philadelphia	30.00	30.00	26.50	29.00
No. 1 cast, Ch'go, net ton	29.50	29.50	25.50	26.00
No. 1 RR. wrot, Phila.	30.00	30.00	28.00	34.00
No. 1 RR. wrot, Ch'go, net	23.00	23.00	19.50	27.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	*$6.00*	$6.50	$6.00	$6.00
Furnace coke, future	6.00	6.00	6.00	6.00
Foundry coke, prompt	7.00	7.00	7.00	7.00
Foundry coke, future	7.00	7.00	7.00	7.00

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	**19.00**	18.75	21.75	26.00
Electrolytic copper, N. Y.	**18.50**	18.25	21.25	26.00
Spelter, St. Louis	**8.37½**	8.10	7.75	8.25
Spelter, New York	**8.72½**	8.45	8.10	8.60
Lead, St. Louis	**6.65**	6.55	6.50	6.75
Lead, New York	**6.90**	6.75	6.75	7.05
Tin, New York	54.00	54.00	53.75	72.00
Antimony, Asiatic, N. Y.	**9.50**	9.25	8.87½	8.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

and forging billets at $60, Pittsburgh, while $65 is being asked by one maker for the latter. Very little is being done in any form of semi-finished steel.

Finished Material.—The fuel situation has added one more obstacle to the acceptance of more business in finished steel. It is virtually impossible to place orders for such products as sheets, wire, nails, pipe and bars. One Eastern mill has accepted a little bar business from regular customers during the past week on the basis of 3.50c., Pittsburgh, for ordinary soft steel bars and 3.75c., Pittsburgh, for bars of reforging quality. Some business can still be done in shapes, but the mills are scrutinizing all inquiries carefully, and in some instances quotations are being made only to regular customers. While there has been no formal advance in the price of shapes some premium business is being taken. The Lukens Steel Co. has advanced the price of plates to 2.85c., Pittsburgh, and predicts another advance to 3c. by the first of the year if present fuel conditions are not ameliorated. Sales have been made on the 2.85c. basis. Deliveries by this mill, which last week made the best tonnage record of the year, are four weeks on universal plates and ten weeks or more on sheared plates. As soon as the fuel situation permits the Lukens company will operate its 204-in. mill and its 142-in. mill at the same time. Although the new mill has been in use for more than a year, the two mills have never been operated at the same time. Another Eastern plate manufacturer is also getting 2.85c., Pittsburgh, on small lots of plates, but would not accept large tonnages at any price. The Philadelphia & Reading Railroad is expected to come into the market shortly for 25,000 tons of heavy rails. No action has been taken on the recent inquiry of the Norfolk & Western Railroad for 26,000 tons of rails. The plant of the Lebanon Valley Iron & Steel Co., Lebanon, Pa., has been shut down owing to lack of fuel, and for such stocks of bar iron as the company is willing to sell it is asking 3.50c., Pittsburgh, for common iron in large lots and 3.75c. for less than 10 ton lots.

Old Material—The prices quoted on various grades of old material in this issue are those at which sales have been made during the past week. The order of the Fuel Administration restricting manufacturing operations to three days a week is apt to soften the market, temporarily at least, but dealers are strong in their views as to the ultimate need for scrap, and it is likely that only forced sales will be made at lower prices.

Cleveland

CLEVELAND, Dec. 9.

Iron Ore.—The ore shipping season has closed with a total movement by water of 47,130,733 gross tons up to Dec. 1. December shipments were lighter than had been expected, probably being less than 10 cargoes, figures on which are not yet available. The total movement was a little less than was expected early in the season, but with the curtailment of consumption because of the steel strike there is no expectation of a shortage before the opening of next season's navigation.

Pig Iron.—Prices continue to advance, and consumers are having more difficulty in placing orders, as the only seller in this territory who has been taking on additional tonnage except in limited quantities has withdrawn from the market. Inquiries for foundry iron for future delivery have fallen off somewhat, but a number of consumers who have been in the market several weeks have not succeeded in placing orders. There is considerable inquiry for early shipment iron, but practically none to be had. Some foundries are buying off Bessemer and basic grades. The last local sales of foundry iron for future delivery were at $36 furnace. A northern Ohio consumer has purchased 5000 to 10,000 tons of basic iron at $34, paying the same price for 1000 tons of off basic for early shipment. A Kentucky consumer is inquiring for 3000 to 5000 tons of basic per month for the first half. We note the sale of a 1000-ton lot of malleable iron by a Valley furnace in Pittsburgh at $36.25 furnace. A limited quantity of Bessemer, foundry and malleable iron is being offered at $38 furnace for early shipment. Alabama furnaces have withdrawn from the market, but

some Tennessee iron is to be had, a sale being reported at $39.75 for 2.75 to 3.25 silicon. The United Furnace, Canton, has blown out because of lack of coal.

Coke.—Previous to the receipt of information today that the Government had placed the wartime price restrictions on coke, a number of sales of Connellsville foundry coke were made at $7.50 for the first half, some sellers making this price subject to any advance in cost that would result from an increase in miners' wages. No spot foundry coke is to be had.

Finished Iron and Steel.—The steel shortage is more acute than at any previous time since the steel strike, but a slight easing up is expected should the coal strike be called off, as some mills that are now accepting no orders would probably again open their books. There is a heavy volume of inquiry for all kinds of finished steel for any delivery. Mills that are able to make deliveries within two or three months have no trouble in getting premium prices. Wire, nails and sheets have reached almost a famine stage, and few steel bars are to be had. Bars in both soft and hard steel are quoted at 3c. to 3.25c., and plates at 3.75c. and higher. Rivet makers have withdrawn prices. Several Cleveland jobbers have advanced warehouse prices. One has marked up all products $5 a ton, and another has advanced steel bars $8 a ton to 3.67c.

Old Materials.—The scrap market is dull, activity being limited largely to trading between dealers. Dealers are buying considerable scrap for yard stocks, and have absorbed a large tonnage of railroad scrap in the last week or two. Several large consumers are not taking shipments. Cast scrap is in good demand and scarce. Prices remain at recent levels except borings and turnings, which are slightly lower.

Cincinnati

CINCINNATI, Dec. 9.

Pig Iron.—Effects of the coal strike are beginning to be felt in this territory. Almost all producers in southern Ohio are out of the market, and the South is similarly affected. A nearby melter is inquiring for 5000 tons of basic for first half shipment, and is expected to buy double the amount if the iron can be obtained. The price for Southern foundry is $35, Birmingham, for silicon 1.15 to 2.25, and in most cases a differential of 4 per cent for each 50 points silicon is added. The general opinion is that no iron is obtainable, although we are in a position to state that there is a small quantity of off grade Southern still to come on the market. Some small lots of high-grade silicon iron have been disposed of at a higher price than the regular schedule, but the quantity is practically negligible. The nominal price of Northern is $36.75, Ironton, but practically none is on the market for the first quarter, all furnaces being sold up. Four blast furnaces were banked in southern Ohio last week, and should strike conditions not soon improve, others will be forced to do likewise, as it is now almost impossible to get coke, and most coke stocks are not sufficient to last over the present week. The inquiry for foundry iron is heavy, but under present conditions it is not likely that any orders will be placed for any part of it.

Old Material.—There is practically no activity in the scrap market, and prices rule the same as last week, the exception being No. 1 machinery, which has advanced $1. The curtailment of steel mill operations due to the coal situation is responsible for this inactivity.

Birmingham

BIRMINGHAM, ALA., Dec. 8.

Pig Iron.—The first week in December closed with every iron interest out of the open market and the price firm at $35. One lot of 150 tons of 4.28 silicon, although high in sulphur, brought $38. A large interest says its current sales are confined to caring for the southern trade at $35. No one is attempting to sell under this level for the very simple reason that there is no occasion to do so. The inquiry is still strong, but indications now point to consumers having fairly well covered for the first quarter, while selling interests have sold all for that period on which delivery can be guaranteed. Special tonnages of unsold grades are quickly disposed of. The November Alabama iron make was 1000 tons in excess of that of November, 1918, when there was no strike. The October output was the largest in a year. Alabama blew in two furnaces during the steel strike and the Alabama Co. blew in a banked stack at Gadsden the past week during the second so-called coal strike.

Old Material.—The scrap market has continued to show some briskness all around with heavy melting steel selling at the new figure. Consumers have been more anxious to cover their steel wants than in some time.

Boston

BOSTON, Dec. 9.

Pig Iron.—During the early part of the week considerable business was put through, most of it in high silicon iron. To-day, however, it is difficult to get a line on the market because of the scarcity of offerings, almost all of the furnaces being out of the market. There is a possibility of increased offerings as a result of a new freight schedule from Alabama shipping points, which has been authorized and is expected to go into effect any day. A large Massachusetts textile interest has bought between 10,000 and 15,000 tons of eastern Pennsylvania and Virginia iron silicon 2.75 to 4.25 on a delivered basis of $40 to $44.70. Portland, Me., and Nashua, N. H., consumers have bought Virginia 2.25 to 2.75 on a delivered basis of $42.70, and there have been small sales of silicon 1.75 to 2.25 on a $39.70 delivered base. An eastern Massachusetts consumer bought 300 tons eastern Pennsylvania silicon 2.25 to 2.75 at $40.90 delivered, and a Providence consumer 100 tons and a large central Massachusetts consumer several hundred tons at $39.90 delivered. Eastern Pennsylvania silicon 1.75 to 2.25 has sold in a small way at $37.90 delivered. Virtually everything sold during the past week was for first half 1920 delivery. We hear of no sales of Buffalo iron.

Warehouse Business.—For the second time within a month there has been a general upward revision in local warehouse quotations on iron and steel. All firms today are quoting on the same basis, whereas a week ago there was considerable spread between prices. The base price on refined iron is now $3.85 per 100 lb., and on steel bars $3.75. Some firms are now making a net price on the various sizes under ½ in., but use the regular base on ½-in. rounds and larger and on ¼-in. flats and thicker. Because of the badly broken condition of steel supplies, warehouses are instructing salesmen in sending in orders to give as much latitude as possible on size and quality. Substitution of iron for steel is on a much larger scale than at any period during the war. Prices on 3-16-in. plates have been marked up from $4.80 to $5.05, but those on other sizes remain unchanged. Warehouse prices on cap and set screws have been advanced 5 per cent to a basis of 45 per cent discount for the former and 50 per cent for the latter. Iron rivets have been advanced 5 per cent, now being quoted at 40 per cent discount.

Old Material.—Machinery scrap continues in excellent demand. Sales have been made during the past week at $34.50 to $35 delivered to consumers at Boston & Maine and New Haven points and to Pennsylvania interests. The movement of scrap out of New England is the leading feature of the market notwithstanding the fact that some dealers are still holding out for higher prices. Business closed since last reports was fully as large as for the previous week. Some small lots of No. 1 scrap have sold as high as $37 delivered. No. 2 scrap has been in active demand at around $30 delivered. New England consumers are in the market for car wheels, but few are to be had.

Buffalo

BUFFALO, Dec. 8.

Pig Iron.—Furnacemen report that almost endless inquiry continues for all grades of iron, including much from outside of regular Buffalo district territory, aggregating a far greater tonnage than producers can satisfy. Only limited emergency amounts of any grade can now be furnished for December of first quarter, to help out old customers who are in a pinch, most furnaces being almost entirely sold up for that period and largely so for first half. One interest, however, states that it has some capacity still available for first half, the Donner Steel Co. Likelihood of great shortage of iron is apparent owing to steadily increasing cost of production on account of labor, coke and other raw materials prices may go up further; but, to date, no advances are contemplated or have been made over last week's schedule. No Bessemer or malleable is obtainable from Buffalo producers, although inquiry for large tonnages is before the market.

Old Material.—The market continues generally strong, although there is a prospect that there will be a lull or cessation in demand from local mills until the coal strike situation assumes a more favorable aspect. The present status is having a tendency to restrain the taking in of additional supplies on the part of mills and check buying. Apparently outside markets exhibit the same conditions, although demand has not stopped and so far no hold-ups of shipping orders have been received. Prices for practically all commodities remain the same as a week ago.

St. Louis

ST. LOUIS, MO., Dec. 8.

Pig Iron.—The pressure to buy pig iron during the past week has been exceptionally heavy with constantly ascending prices. The total tonnage sold is estimated at more than 25,000 tons, in lots ranging from 1000 tons downward. Representatives of furnaces report that they have never experienced such pressure as they have during the last fortnight for iron, and also that prices have been changing over night, in one instance $3 per ton. At this writing northern iron is held at $38 per ton Ironton, but it is expected to go higher, this figure being quoted for first-half delivery. Virginia iron has sold at $40 per ton furnace, 2.25 to 2.75 silicon. The local furnace has steadily marked up its prices until it has reached $42 per ton furnace, which is $7 per ton higher than the figure at which it is reported to have sold 10,000 tons of basic within the past two weeks. Its last jump in price was $3.50 per ton. Southern iron is keeping pace with that from other sources of supply.

Old Material.—The scrap dealers are feeling a little more optimistic, and are speculating more freely, as a result of which prices are somewhat stronger. Quotations would rise sharply, and heavy buying would take place, if there were a greater degree of certainty regarding the coal situation.

Chicago

CHICAGO, Dec. 9.

Chicago office buildings and industrial plants, including those classed as non-essential by the Fuel Administration, operated yesterday and to-day from 9 a. m to 3.30 p. m. All were supplied with power and light during those hours, not excepting 150 industries which had been denied service by the Chicago Sanitary District since last Thursday. Even should the coal strike be settled to-day, the restrictions governing the distribution and use of coal will probably continue in effect for a month and then will be lifted by degrees, according to a statement given out by T. W. Proctor, chairman of the Northwestern Regional Coal Committee. It is estimated that it will take at least 10 days for the first shipments of newly mined coal to reach Chicago, as many more for receipts to reach normal, and a considerable period thereafter to build up exhausted reserves.

Whatever the ultimate outcome of the basing point controversy, it has no present significance, with prices a decidedly subordinate consideration. The efforts of consumers, both domestic and foreign, are directed toward getting material and they are experiencing increasing difficulty in placing their orders even when offered on the basis of the quotations ruling at the time of delivery. The leading interest is booked ahead on soft steel bars for about six months, and because of the delay in operations resulting from the steel and coal strikes, is now taking no orders for bars, shapes and plates except for delivery subject to mills' convenience. The foremost independent is practically sold up until July 1. All the rail-carbon steel bar mills in this district are idle and most of the bar iron plants are down. One bar iron mill which is still operating is in a position to book small orders for prompt delivery, but is not quoting on 1920 business.

Pig Iron.—Prices continue to forge upward, but the Government restriction permitting foundries to operate only three days a week during the fuel shortage is expected to curtail the demand for iron. The leading Northern producer is accepting orders for limited tonnages at $40 base, Chicago, for 1.75 to 2.25 per cent foundry. One important Southern producer continues to offer prompt foundry on a $35 Birmingham base, but is not yet quoting on 1920 business. This maker recently took an order for 1750 tons at that price basis for December shipment. An Ohio furnace sold 300 tons of 1.75 to 2.25 per cent foundry at $39 f.o.b. stack, the freight to Chicago being $3.10. This same producer recently booked 2500 tons of foundry in this territory for first half delivery at $37 base furnace.

Old Material.—The scrap market is on the whole dull and uncertain on account of the fuel situation. With the exception of cast scrap, which is still advancing, and busheling and cut forge, which are somewhat weaker, prices are largely nominal and on about the same level as a week ago.

Plates and Shapes.—A Pacific Coast ship builder has purchased 9000 tons of steel, largely plates, for the construction of tank vessels. An inquiry for 3000 tons, principally plates, is current. This material is desired for car repair work. The Manhattan Oil Co., Minneapolis, is in the market for 200 tank cars involving about 2500 tons, most of which will be plates. Tank car construction has been stimulated by the expansion of the oil industry, but it is feared the master car builders' rule, effective Jan. 1, requiring the use of fine steel in tank construction, will seriously delay the fulfillment of the refiners' requirements after that time. For that reason pressure is being brought to bear on the Car Builders' Association to postpone the effective date of its regulation. The Lackawanna Bridge Co. will fabricate 650 tons for a power house to be erected for the Continental Motors Corporation at Muskegon, Mich. Heyl & Patterson, Pittsburgh, will furnish about 500 tons for a coal handling bridge for the C. Reiss Coal Co., Green Bay, Wis. Other fabricating awards during the past week aggregate about 760 tons. Bids are now being asked on approximately 6000 tons for the Beloit, Wis., foundry of Fairbanks, Morse & Co. The specifications of the Magnolia Building, Dallas, Tex., have been altered and now call for about 3500 tons of fabricated steel. Holabird & Roche, Chicago architects, are asking for figures on a five-story addition to the Hotel Sherman.

New York

NEW YORK, Dec. 9.

Pig Iron.—The market has continued its upward rise and iron is scarcer than a week ago. Some furnaces are banking and those prepared to blow in must postponed that operation. Buyers of Southern iron are interested in the agreement of two steamship companies to carry iron north at lower than existing rates, provided the Government gives its sanction. There is an inquiry from a railroad supply manufacturer for 3500 tons of Bessemer, malleable and charcoal iron for next

(*Continued on page* 1230)

Pittsburgh

Pig Iron

The following quotations are all per gross ton at Valley furnaces, freight rate for delivery in the Cleveland and Pittsburgh districts being $1.40 per ton.

Basic	$34.00
Bessemer	35.00
Gray forge	35.00
No. 2 foundry	36.00
No. 3 foundry	35.50
Malleable	35.00

Ferroalloys

We quote 78 to 82 per cent domestic ferromanganese $120 delivered, and English at $102 to $105, with a reduction of $1.50 to $1.75 per unit for lower percentages. We quote resale 50 per cent ferrosilicon at $80 to $82 and 18 to 22 per cent spiegeleisen at $33 to $35, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, $56.50; 10 per cent, $59.50; 11 per cent, $62.50; 12 per cent, $66.10. We quote 6 per cent silvery iron, $43.75; 7 per cent, $48.00; 8 per cent, $50.00; 9 per cent, $52.00, and 10 per cent, $54.50. An advance of $3.30 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of $2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b. makers' furnace, Jackson or New Straitsville, Ohio, which have a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Billets and Sheet Bars

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $45; 2 x 2-in. billets at $45 to $47; slabs, $47 to $48; sheet bars, $47 to $48, and forging billets, $60 to $65 base, all f.o.b. at mill Pittsburgh or Youngstown.

Iron and Steel Bars

We quote steel bars rolled from billets at 2.75c. and from old steel rails, 2.45c. Pittsburgh mills rolling iron bars quote at 3.25c. Pittsburgh, plus full freight rate to point of delivery.

Structural Material

Beams and channels up to 15-in., 2.45c. Pittsburgh, large lots.

Plates

Sheared tank plates, ¼-in. and heavier, at 2.65c. to 2.75c. Pittsburgh, depending on order and delivery.

Spikes

We quote standard spikes, 9/16 x 4½ in., at $3.35 base per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, ⅜ in., 7/16 in. and smaller, at $4.25 per 100 lb. in carload lots of 200 kegs of 200 lb. each, plus usual extras. Boat and barge spikes, $4.25 per 100 lb. in carload lots of 200 kegs of 200 lb. each, all f.o.b. Pittsburgh. For less than carloads 1c. per lb. higher is asked.

Cold Rolled Strip Steel

We quote cold rolled steel at $6.00 base per 100 lb. f.o.b. Pittsburgh, for 1½-in. and wider, 0.1000 in. and thicker hard tempered in coils 0.20 carbon and under. Boxing charge, 25c. per 100 lb.

Old Material

Heavy steel, melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$23.00 to $24.00
No. 1 cast for steel plants	27.00 to 28.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	29.00 to 30.00
Compressed steel	18.00 to 19.00
Bundled sheet sides and ends, f.o.b. consumers' mills, Pittsburgh district	17.00 to 18.00
Bundled steel stamping	15.00 to 15.50
No. 1 busheling	22.00 to 23.00
Railroad grate bars	20.50 to 21.00
Low phosphorus melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	26.00 to 26.50
Railroad malleable	22.00 to 23.00
Iron car axles	31.00 to 32.00
Locomotive axles, steel	31.00 to 32.00
Steel car axles	28.00 to 29.00
Railroad malleable	22.00 to 23.00
Cast iron wheels	25.50 to 26.00
Rolled steel wheels	24.00 to 25.00
Machine shop turnings	13.00 to 14.00
Sheet bar, crop ends (at origin)	26.00 to 27.00
Heavy breakable cast	21.50 to 21.75
Cast iron borings	17.00 to 17.50
No. 1 railroad wrought	23.00 to 24.00

Chicago

Pig Iron

The following quotations are for iron delivered at consumers' yards except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnaces and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, average silicon 1.50, f.o.b. furnace, average freight to Chicago, $2.50 (other grades subject to usual differentials)	$40.00 to $45.00
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	42.50
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	40.00
Northern high phosphorus foundry	40.00
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25	42.70
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	41.35
Southern foundry, silicon 1.75 to 2.25	40.00
Malleable, not over 2.25 silicon	40.50
Basic	39.00
Low phosphorus (copper free)	45.00
Silvery, 7 per cent	49.15 to 51.80

Plates

The mill quotation is 2.65c. Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. for plates out of stock.

Structural Material

The mill quotation is 2.45c. Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote $3.47 for materials out of warehouse.

Ferroalloys

We quote 80 per cent ferromanganese at $120 delivered; 50 per cent ferrosilicon at $85 to $90 delivered; spiegeleisen, 18 to 22 per cent, $40 furnace.

Iron and Steel Bars

Mill prices are: Mild steel bars, 2.85c. to 3.25c. Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.77c. to 3c. Chicago; rail carbon, 3c. mill. Jobbers quote 3.37c. for steel bars out of warehouse.

Cast Iron Pipe

We quote per net ton f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $65.80; 6-in. and above, $62.80; class A and gas pipe, $2 extra.

Bolts and Nuts

Jobbers quote: Structural rivets, 4.72c.; boiler rivets, 4.82c.; machine bolts up to ⅞ x 4 in., 35 and 5 per cent off; larger sizes, 25 and 5 off; carriage bolts up to ⅞ x 6 in., 30 off; larger sizes, 20 off; hot pressed nuts, square tapped and hexagon tapped, $1.45 off; coach or lag screws, gimlet points, square heads, 40 and 5 per cent off. Quantity extras are unchanged.

Sheets

Mill quotations are 4.35c. for No. 28 black, 3.55c. for No. 10 blue annealed, and 5.70c. for No. 28 galvanized.

Jobbers quote Chicago delivery out of stock; No. 10 blue annealed, 4.57c.; No. 28 black, 5.62c., and No. 28 galvanized, 6.97c.

Rails and Track Supplies

Standard railroad spikes, 3.35c. Pittsburgh. Track bolts with square nuts, 4.35c. Pittsburgh. Steel tie plates and iron angle bars, 2.75c. Pittsburgh and Chicago; tie plates, iron, 2.90c. f.o.b. makers' mills. Light rails, 2.45c. f.o.b. makers' mills, with usual extras.

Old Material

We quote delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$27.00 to $28.00
Relaying rails	40.00 to 50.00
Car wheels	30.00 to 31.00
Steel rails, rerolling	31.00 to 32.00
Steel rails less than 3 ft.	25.00 to 25.50
Heavy melting steel	20.50 to 21.50
Frogs, switches and guards, cut apart	20.50 to 21.50
Shoveling steel	20.50 to 21.00
Per Net Ton	
Iron angles and splice bars	$27.50 to $28.50
Steel angle bars	21.50 to 22.00
Iron arch bars and transoms	28.50 to 29.50
Iron car axles	33.50 to 34.50
Steel car axles	30.00 to 30.50
No. 1 busheling	18.00 to 18.50
No. 2 busheling	13.25 to 13.75
Cut forge	19.75 to 20.25
Pipes and flues	17.00 to 17.50
No. 1 railroad wrought	23.00 to 24.00
No. 2 railroad wrought	20.50 to 21.00
Steel knuckles and couplers	21.50 to 22.00
Coil springs	23.00 to 23.50
No. 1 cast	30.50 to 31.00
Boiler punchings	23.50 to 24.00
Locomotive tires, smooth	20.50 to 21.00
Machine shop turnings	10.50 to 11.00
Cast borings	11.50 to 12.50
Stove plate	24.50 to 25.50
Grate bars	25.25 to 26.25
Brake shoes	21.00 to 22.00
Railroad malleable	24.00 to 25.00
Agricultural malleable	24.00 to 25.00
Country mixed	16.50 to 17.50

Philadelphia

Pig Iron

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

Eastern Penn., No. 2X, 2.25 to 2.75 sil.	$40.10 to $41.10
Eastern Penna., No. 2 plain, 1.75 to 2.25 sil.	39.10 to 40.10
Virginia No. 2 X, 2.25 to 2.75 sil.	43.10 to 43.35
Virginia No. 2 plain, 1.75 to 2.25 sil.	42.10
Basic deliv. Eastern Pa. (nominal)	35.00 to 36.00
Gray forge	36.10
Standard low phosphorus (f.o.b. furnace)	45.00
Malleable	36.00 to 37.00
Copper bearing low phosphorus (f.o.b. furnace)	40.00

Old Material

No. 1 heavy melting steel	$22.50 to $24.00
Steel rails rerolling	31.00 to 32.00
No. 1 low phosphorus heavy, 0.04 and under	27.00 to 28.00
Car wheels	30.00 to 31.00
No. 1 railroad wrought	30.00 to 31.00
No. 1 yard wrought	25.00 to 26.00
No. 1 forge fire	17.50 to 18.50
Bundled skeleton	17.50 to 18.50
No. 1 busheling	20.00 to 21.00
No. 2 busheling	16.50 to 17.50
Turnings (short shoveling grade for blast furnace use)	18.00 to 18.50
Mixed borings and turnings (for blast furnace use)	16.00 to 16.50
Machine shop turnings (for rolling mill and steel works use)	18.50 to 19.00
Heavy axle turnings (or equivalent)	20.00 to 21.00
Cast borings (for rolling mills)	22.00 to 23.00
Cast borings (for chemical plant use)	24.50 to 25.00
No. 1 cast	30.00 to 31.00
Railroad grate bars	26.00 to 27.00
Stove plate	22.50 to 23.50
Railroad malleable	25.00 to 26.00
Wrought iron and soft steel pipes and tubes (new specifications)	22.00 to 23.00
Ungraded pipe	17.00 to 18.00
Iron car axles	45.00 to 46.00
Steel car axles (f.a.s. New York for export)	32.00 to 33.00

Birmingham

Pig Iron

Foundry, silicon 1.75 to 2.25	$35.00
Basic	34.00

Old Material

Steel rails	$20.00 to $21.00
No. 1 heavy steel	19.00 to 20.00
Cast iron borings	14.00 to 15.00
Machine shop turnings	14.00 to 15.00
Stove plate	22.00 to 23.00
No. 1 cast	24.00 to 25.00
Car wheels	24.00 to 25.00
Tramcar wheels	23.00 to 24.00
Steel axles	26.00 to 27.00
No. 1 wrought	21.00 to 22.00

Buffalo

Pig Iron

No. 1 foundry, 2.75 to 3.25 silicon	$41.00
No. 2 X, 2.25 to 2.75 silicon	39.25
No. 2 plain foundry, 1.75 to 2.25 silicon	38.00
Malleable, silicon not over 2.25	39.25
Basic	36.00
Lake Superior charcoal, regular grades, f.o.b. Buffalo	38.40

Old Material

Heavy melting steel, regular grades	$23.00 to $23.50
Low phosphorus, 0.04 and under	27.00 to 28.00
No. 1 railroad wrought	28.00 to 29.00
No. 1 machinery cast	29.00 to 29.50
Iron axles	33.00 to 34.00
Steel axles	33.00 to 36.00
Car wheels	26.50 to 27.50
Railroad malleable	23.00 to 24.00
Machine shop turnings	13.50 to 14.00
Heavy axle turnings	18.50 to 19.50
Clean cast borings	19.00 to 20.00
Iron rails	28.00 to 29.00
Locomotive grate bars	22.00 to 22.50
Stove plate	23.00 to 23.50
Wrought pipe	18.50 to 19.00
No. 1 busheling	20.00 to 21.00
Bundled sheet stamping	16.00 to 17.00

New York

Pig Iron

No. 1 foundry, silicon 2.75 to 3.25	$42.80
No. 2 X, silicon 2.25 to 2.75	41.80
No. 2 plain, silicon 1.75 to 2.25	40.80
No. 2 X, Virginia, silicon 2.25 to 2.75	41.65

Finished Iron and Steel

We quote as follows for mill shipments: Bar iron, refined grade, 3.27c.; soft steel bars, 3.12c.; shapes, 2.72c.; plates, 2.92c.; all New York.

Old Material

Heavy melting steel	$19.00 to $19.50
Rerolling rails	27.00 to 28.00
Relaying rails, nominal	47.00 to 48.00
Steel car axles	28.00 to 29.00
Iron car axles	40.00 to 41.00
No. 1 railroad wrought	27.00 to 27.50
Wrought iron track	20.00 to 20.50
Forge fire	15.00 to 16.00
No. 1 yard wrought, long	20.50 to 21.00
Light iron	6.00 to 7.00
Cast borings (clean)	16.50 to 17.00
Machine shop turnings	14.00 to 14.50
Mixed borings and turnings	13.00 to 13.50
Iron and steel pipe (1 in. min. diam., not under 2 ft. long)	18.50 to 19.00
Stove plate	20.50 to 21.00
Locomotive grate bars	22.50 to 23.00
Malleable cast (railroad)	22.50 to 23.00
Old carwheels	28.00 to 29.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast	30.00 to 31.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	29.00 to 30.00
No. 1 heavy cast, not cupola size	21.00 to 22.00
No. 2 (radiators, cast boilers, etc.)	20.00 to 21.00

Cleveland

Iron Ore

Old range Bessemer, $6.45; old range non-Bessemer $5.70; Mesaba Bessemer, $6.20; Mesaba non-Bessemer, $5.55.

Pig Iron

Basic	$34.40
Northern No. 2 foundry, silicon 1.75 to 2.25	36.40
Southern foundry, silicon 2.25 to 2.75	40.35
Gray forge	35.40
Ohio silvery, silicon, 8 per cent	52.40
Standard low phos., Valley furnace	$43.00 to 44.00

Finished Iron and Steel

Steel bars 3.25c.; plates, 3.57c.; structural shapes, 3.37c.; bands and hoops, 3.97c.; No. 10 blue annealed sheets, 4.27c.; No. 28 black sheets, 5.27c.; No. 28 galvanized sheets, 6.62c.

Old Material

Heavy melting steel	$20.75 to $21.25
Steel rails, under 3 ft	25.00 to 26.00
Steel rails, rerolling	29.00 to 30.00
Iron rails	29.00 to 30.00
Iron car axles	35.00 to 36.00
Steel car axles	33.00 to 34.00
Low phosphorus melting scrap	22.50
Cast borings	15.75 to 16.00
Iron and steel turnings and drillings	13.00 to 13.50
Short turnings (for blast furnaces)	14.00 to 14.50
Compressed steel	17.75 to 18.00
No. 1 railroad wrought	22.00 to 23.00
Railroad malleable	24.00 to 25.00
Agricultural malleable	20.00 to 21.00
Steel axle turnings	17.00 to 17.50
Light bundled sheet scrap	14.50 to 15.00
No. 1 cast	28.00 to 29.00
No. 1 busheling	20.00 to 21.00
Drop forge flashings, 10 in. and under	18.50 to 19.50
Drop forge flashings, over 10 in.	16.50 to 17.00
Railroad grate bars	23.00 to 24.00
Stove plate	23.00 to 24.00

Cincinnati

Pig Iron

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, silicon 1.75 to 2.25 (base price)	$38.60
Southern coke, silicon 2.25 to 2.75 (No. 2 soft)	40.00
Ohio silvery, 8 per cent silicon	51.80
Southern Ohio coke, silicon 1.75 to 2.25 (No. 2)	38.55
Basic, Northern	36.05
Standard Southern car wheel	48.60
Malleable	$38.05 to 39.05

Old Material

Per Gross Ton

Bundled sheet	$13.50 to $14.00
Old iron rails	23.50 to 24.00
Relaying rails, 50 lb. and up	41.00 to 42.00
Rerolling steel rails	22.00 to 22.50
Heavy melting steel	16.00 to 17.00
Steel rails for melting	17.50 to 18.00
Old car wheels	19.00 to 19.50
No. 1 railroad wrought	19.00 to 19.50

Per Net Ton

Cast borings	$8.50 to $9.00
Steel turnings	8.00 to 8.25
Railroad cast	21.00 to 21.50
No. 1 machinery	24.00 to 24.50
Burnt scrap	14.00 to 15.00
Iron axles	25.00 to 25.50
Locomotive tires (smooth inside)	19.50 to 20.00
Pipes and flues	15.00 to 15.50
Malleable cast	16.50 to 17.00
Railroad tank and sheet	14.00 to 14.50

St. Louis

Old Material

Per Gross Ton

Old iron rails	$27.50 to $28.00
Old steel rails, rerolling	32.00 to 32.50
Old steel rails, less than 3 ft	25.00 to 25.50
Relaying rails, standard sections, subject to inspection	38.00 to 45.00
Old car wheels	26.00 to 26.50
No. 1 railroad heavy melting steel	22.00 to 22.50
Heavy shoveling steel	20.50 to 21.00
Ordinary shoveling steel	19.50 to 20.00
Frogs, switches and guards, cut apart	21.50 to 22.00
Ordinary bundled sheets	13.00 to 13.50
Heavy axle and tire turnings	15.50 to 16.00

Per Net Ton

Iron angle bars	$24.00 to $24.50
Steel angle bars	21.50 to 22.00
Iron car axles	32.50 to 33.00
Steel car axles	32.00 to 32.50
Wrought arch bars and transoms	27.00 to 27.50
No. 1 railroad wrought	28.00 to 28.50
No. 2 railroad wrought	22.00 to 22.50
Railroad springs	21.00 to 21.50
Steel couplers and knuckles	21.00 to 21.50
Locomotive tires, 42 in. and over, smooth inside	21.00 to 21.50
No. 1 dealers' forge	20.50 to 21.00
Cast iron borings	11.50 to 12.00
No. 1 busheling	20.50 to 21.00
No. 1 boiler, cut to sheets and rings	17.00 to 17.50
No. 1 railroad cast	27.50 to 28.00
Stove plate and light cast	25.50 to 26.00
Railroad malleable	21.50 to 22.00
Agricultural malleable	21.00 to 21.50
Pipes and flues	18.50 to 19.00
Heavy railroad sheet and tank	17.00 to 17.50
Machine shop turnings	12.50 to 13.00
Country mixed	18.00 to 18.50
Uncut railroad mixed	18.50 to 19.00
Horseshoes	21.50 to 22.00

Boston

Pig Iron

Eastern Pa., No. 2 X silicon 2.25 to 2.75	$39.90 to $40.90
Eastern Pa., No. 2 plain silicon 1.75 to 2.25	38.90 to 39.90
Buffalo, No. 2 X silicon 2.25 to 2.75	39.90 to 40.90
Buffalo, No. 2 plain silicon 1.75 to 2.25	38.90 to 39.90
Virginia, No. 2 X silicon 2.25 to 2.75	42.20 to 43.20
Virginia, No. 2 plain silicon 1.75 to 2.25	40.95 to 41.95

Old Material

No. 1 heavy melting steel	$18.00 to $18.50
No. 1 railroad wrought	25.50 to 26.00
No. 1 yard wrought	22.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	17.50 to 18.00
Machine-shop turnings	13.50 to 14.00
Cast iron borings	16.00 to 17.50
Heavy axle turnings	15.50 to 16.00
Blast furnace borings and turnings	12.50 to 13.00
Forge scrap	13.50 to 14.00
Bundled skeleton	13.50 to 14.50
Steel car axles	27.00 to 28.00
Car wheels	28.00 to 29.00
Machinery cast	32.00 to 33.00
No. 2 cast	29.00 to 30.00
Stove plate	21.00 to 22.00
Railroad malleable	20.00
Rerolling rails	26.50 to 27.50

Warehouse Prices

Jobbers quote: Steel bars, cold rolled rounds, $5 per 100 lb. base; squares, hexagons, flats, $5.50 base; soft steel, flats, rounds, squares, $3.75 base; structural steel, $3.75; tire steel, $4.45; spring steel, open hearth, $8; special, $12; toe calk steel, $5.50; steel hoops, $5.20; steel bands, $4.95; best iron flats, rounds and squares, $5.75 base; refined iron, $3.85; No. 10 blue annealed sheets $5.10; No. 28 black sheets, $7.15; No. 28 galvanized sheets, $8.50; plates, $3.95.

IRON AND STEEL MARKETS

(*Continued from page* 1227)

year. A sale of charcoal iron for next year is noted, but in other grades practically no sales are being made. An Eastern Pennsylvania producer, who usually sells a trifle under the average price, is now asking $40, furnace, for silicon 1.75 to 2.25. A market price is hard to establish, but seems to have reached $40. Sellers are busier attending complaints of nondelivery than they were selling iron in normal times. A prominent seller is quoting $41 for 2.75 to 3.25, $40 for 2.25 to 2.75, and $39 for 1.75 to 2.25, all at furnace and eastern Pennsylvania iron. According to the new Government-imposed coke rates the price for by-product foundry coke at Jersey City is $9.69 and for furnace coke, $8.69.

Ferroalloys.—Sales of domestic ferromanganese continue to be made at $120, delivered, but the orders do not run into large figures. The market is quiet but strong. The representative of a British producer, who a week ago was selling a limited quantity of British 76 to 80 per cent alloy at $110, seaboard, for delivery in the first quarter, has sold all that was available. Domestic production of ferromanganese in November, according to the blast furnace reports of THE IRON AGE was 15,464 gross tons with the spiegeleisen output 4500 tons. Demand for spiegeleisen is excellent and the market is higher at $39 to $40, furnace. One seller still quotes $45, furnace. Demand for 50 per cent ferrosilicon is fair and the market is quotable at $80 to $85 per ton delivered.

Finished Iron and Steel.—There is virtually no steel for the open market except odd lots in brokers' hands, for which fancy prices are being asked and obtained. A Buffalo mill has sold fair-sized lots of billets and bars for first quarter shipment, most of this for export. Up to 3.25c., Pittsburgh, has been obtained for soft steel bars in a limited range of sizes and $48.50, Pittsburgh, for 4 x 4-in. open-hearth rerolling billets. Most of the makers of plates in the East are now out of the market or are quoting higher prices and limiting their sales to small lots to regular customers. Two Eastern mills are quoting 2.85c., Pittsburgh, on plates, and some business has been booked on that basis. Exporters are doing comparatively little owing to the scarcity of steel. Railroads are beginning to send out "feelers" which indicate that large orders for cars may be placed after the return of the roads to their owners. After two years of Government operation there is a large shortage of locomotives, cars and rails, which will be at least partly made up in 1920 if financing can be arranged. The normal maintenance requirements of the railroads of the country are put at 3000 locomotives, 80,000 freight cars, 20,000 passenger cars and 1,750,000 tons of rails. During 1918 and 1919 only 1800 locomotives were built; therefore a shortage of 4200 exists at present, which with 1920 maintenance requirements, would make a total of 7200 needed. Only 100,000 freight cars and no passenger cars were built during the two-year period, resulting in a present shortage of 60,000 freight cars and 40,000 passenger cars. With 1920 requirements added, there will be a need in 1920 for 140,000 freight cars and 60,000 passenger cars. These figures represent the needs of the roads if they are to be put back to their pre-war condition. There is the possibility that actual purchases may be in smaller volume due to financial or other causes. The Pressed Steel Car Co. has been awarded an order for 510 hopper cars by the Interstate Railroad of West Virginia. The same company will also build 50 ore cars for the Chile Exploration Co. The Havana Central Railroad of Cuba is in the market for 250 box and flat cars. The American Locomotive Co. has booked several foreign orders, including seven locomotives for the Shantung Railway, China; eight for the Sorocabana Railways of Brazil and four for the Imperial Taiwan Railways of Japan. There are quite a number of other foreign locomotive inquiries in the market. Structural steel awards include the following: An addition to the plant of the H. H. Franklin Mfg. Co., Syracse, N. Y., 300 tons, to American Bridge Co.; bridge for the Boston & Maine Railroad, 200 tons, to Boston Bridge Works; apartment house in New York, 900 tons, to the A. E. Norton Co.; Century Theater, Baltimore, 1100 tons, to Harris Structural Steel Co.; factory building for the Standard Guano Co., Baltimore, to Shoemaker, Satterthwaite Bridge Co.; the Hartford Times Building, Hartford, Conn., 250 tons, to Levering & Garrigues Co.; factory building for the Susquehanna Silk Co., Huntingdon, Pa., 300 tons, to American Bridge Co.; addition to plant of American Chain Co., York, Pa., 200 tons, to unnamed bidder; Southern New England Telephone Co. building, Hartford, Conn., 300 tons, to American Bridge Co.; addition to Bush Terminal Building, New York, 650 tons, American Bridge Co. The City of New York has decided to postpone construction of the Newtown High School, for which 800 tons had been inquired for.

Cast Iron Pipe.—The expected raise in price of cast iron pipe has come, all sizes having been increased by $4 a ton, which is $1 a ton greater increase than was reported from Chicago a week ago. There is a big demand for oil pipe. Export inquiries are few in number and small in tonnage, but domestic business is keeping manufacturers busy. Manufacturers report an abundance of pig iron and scrap on hand in spite of the shortage in raw material. We now quote 6-in. and heavier at $62.30, New York; 4-in. $65.30, with $2 additional for Class A and gas pipe.

Old Material.—The market continues to advance in the same ratio as pig iron, though there is a trifle more uncertainty for the immediate present because of the coal strike situation. One of the more conservative brokers has reduced buying prices on some grades by $1, warning his representatives that "some grades are practically unsalable, and if the coal situation does not clear up, it will be impossible to get orders." The majority of dealers and brokers are extremely optimistic over what the market will be when the coal situation is settled and expect further marked rises in prices.

British Plants Shutting Down

Heavy Demand for Pig Iron—America Inquiring for Steel—Japan Buying Tin Plate

(*By Cable*)

LONDON, ENGLAND, Dec. 8.

Traffic conditions are steadily getting worse, largely because of Government interference. Works are stopping in all directions, the plant of the Cousett Iron Co., in Durham, and the Ebbw Vale plant in Monmouthshire being now idle. Wages of Midland iron workers have been advanced 7½ per cent.

Demand for pig iron is greater than ever. Ferromanganese has been sold to Germany at £25 f.o.b. Germany has also bought American spiegeleisen at $47 c.i.f.

The tin plate output is about 75 per cent of capacity. Japan is endeavoring to repurchase plate bought in America which cannot be obtained and has just purchased 24,000 boxes of salmon sizes and is now wanting 30,000 more at 47s. for prompt delivery, 46s. for first quarter and 45s. to 45s. 6d. for second quarter.

Welsh sheet bars are quoted at £16 16s. and steel bars at £21 5s. to £22 5s. Boiler plates are quoted at £24 to £26. Galvanized sheets, 24 gage, are being offered at £41 f.o.b., for March-April delivery.

Quotations for these and other products are as follows:

	£	s.	d.		£	s.	d.
Ship plates	21	0	0	to	23	0	0
Boiler plates	24	0	0	to	26	0	0
Tees	18	15	0	to	19	15	0
Channels	18	0	0	to	19	0	0
Beams	17	10	0	to	18	10	0
Round bars, ¾ to 3 in.	21	5	0	to	22	5	0
Rails, 60-lb. and up	16	10	0	to	16	15	0
Billets and sheet bars	15	10	0	to	16	0	0
Steel hoops	25	15	0	to	26	0	0
Tin plates	0	45	6	to	0	46	0
Galvanized sheets, 24 g.	41	0	0	to	..	..	..

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Prices quoted below represent as closely as they can be given those charged by mills to their regular trade for indefinite shipment. Owing to practical famine in supply of finished steel products and the heavy demand existing, tenders of new business are being made to the mills by jobbers and consumers at higher prices than those quoted below, but as a rule the mills are turning this offered business away.)

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49.5½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 80,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload, 40,000 lb.; and $1.25, minimum carload, 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. Jacksonville, Fla., all rail, car lots, 41.5c.; less, 59c.; rail and water, car lots, 34.5c.; less, 46.5c. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.45c.

Wire Products

Wire nails, $4.00 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50, and shorter than 1 in., $2.00. Bright basic wire, $3.25 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barbed wire and fence staples, $4.45; painted barbed wire, $3.75; polished fence staples, $4.50; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60 per cent off list for carload lots, 59 per cent for 1000-rod lots, and 58 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$4.10 base
Large boiler rivets.....$4.20
Small rivets, ¼ in., 5/16 in. and 7/16 in. diameter, 50 per cent off list
Machine bolts, hp. nuts, ⅜ in. x 4 in.:
  Smaller and shorter, rolled threads.50 and 10 per cent off list
  Cut threads .....50 per cent off list
  Larger and longer sizes.....40 and 5 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
  Smaller and shorter.....40 and 5 per cent off list
  Larger and longer.....35 and 5 per cent off list
Carriage bolts, ⅜ in. x 6 in.:
  Smaller and shorter, rolled threads..45 and 5 per cent off list
  Cut threads .....40 and 5 per cent off list
  Larger and longer sizes.....30 and 10 per cent off list
Lag bolts .....50 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3.....50 per cent off list
Plow bolts, Nos. 4 to 10.....50 plus 20 per cent off list
Hot pressed nuts, sq. blank.....2.50c. per lb. off list
Hot pressed nuts, hex. blank.....2.50c. per lb. off list
Hot pressed nuts, sq. tapped.....2.25c. per lb. off list
Hot pressed nuts, hex. tapped.....2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank....2.50c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped....2.25c. per lb. off list
Semi-finished hex. nuts:
  ⅝ in. and larger.....65 per cent off list
  9/16 in. and smaller .....70 and 10 per cent off list
Stove bolts in packages.....75-10 per cent off list
Stove bolts in bulk.....75-10-2½ per cent off list
Tire bolts .....60-10 per cent off list

The above discounts are from Nov. 1, 1919.
All prices carry standard extras, Pittsburgh basis.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $60 to $65; chain rods, $65 to $70; screw rivet and bolt rods and other rods of that character, $65 to $70. Prices on high carbon rods are irregular. They range from $75 to $100, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, ½ in., 9/16 in. and larger, $3.35 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ⅜ in., 7/16 in. and smaller, $3.85 to $4 per 100 lb. in lots of 200 kegs of 200 lb. each or more; track bolts, $4.35 to $4.50 per 100 lb. in carload lots of 200 kegs or more, with the usual extras for small lots. Boat and barge spikes, $3.85 to $4 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.75c. from mill. Bar iron, 3.25c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	50½	24	¼ and ⅜	29½	2½
½	54½	40	½	30½	3½
¾ to 3	57½	44	¾	34½	16½
			⅞ to 1½	30	23½

Lap Weld

2	50½	38	1½	38½	..
2½ to 6	53½	41	1¼	24½	9½
7 to 12	50½	37	1½	31½	17½
13 and 14	41	..	2	32½	18½
			2½ to 6	34½	21½
			7 to 12	31½	18½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	46½	29	⅛, ¼ and ⅜	28½	11½
½	51½	39	½	33½	20½
¾ to 1½	55½	43	¾ to 1½	39½	24½
2 to 3	56½	44			

Lap Weld, extra strong, plain ends

2	48½	37	1¼	25½	10½
2½ to 4	51½	40	1½	31½	17½
4½ to 6	50½	39	2	33½	20½
7 to 8	46½	33	2½ to 4	35	23½
9 to 12	41½	28	4½ to 6	34½	22½
			7 to 8	26½	14
			9 to 12	21½	9

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh.

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	40½	3½ to 4½ in.	—16
2½ to 3¼ in.	30½	3 to 3¼ in.	— 1½
2¼ in.	24	2½ to 2¾ in.	+ 1
1¾ to 2 in.	19½	2 to 2¼ in.	+10
		1¾ to 1⅞ in.	+20

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ to 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiations.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

	Cents per lb.
Blue Annealed—Bessemer	
No. 8 and heavier	3.50
Nos. 9 and 10 (base)	3.55
Nos. 11 and 12	3.60
Nos. 13 and 14	3.65
Nos. 15 and 16	3.75
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.15
Nos. 22 to 24	4.20
Nos. 25 and 26	4.25
No. 27	4.30
No. 28 (base)	4.35
No. 29	4.45
No. 30	4.55
Galvanized, Black Sheet Gage—Bessemer	
Nos. 10 and 11	4.70
Nos. 12 to 14	4.80
Nos. 15 and 16	4.95
Nos. 17 to 21	5.10
Nos. 22 to 24	5.25
Nos. 25 and 26	5.40
No. 27	5.55
No. 28 (base)	5.70
No. 29	5.95
No. 30	6.20
Tin-Mill Black Plate Bessemer	
Nos. 15 and 16	4.15
Nos. 17 to 21	4.20
Nos. 22 to 24	4.25
Nos. 25 to 27	4.30
No. 28 (base)	4.35
No. 29	4.40
No. 30	4.40
Nos. 30½ and 31	4.45

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

Dec.	Copper, New York: Lake	Copper, New York: Electrolytic	Tin, New York	Lead: New York	Lead: St. Louis	Spelter: New York	Spelter: St. Louis
3	18.50	18.12½	53.25	6.75	6.55	8.50	8.15
4	18.25	18.00	53.50	6.75	6.55	8.60	8.25
5	18.25	18.12½	53.50	6.90	6.65	8.55	8.20
6	18.50	18.25	.....	6.90	6.65	8.60	8.25
8	19.00	18.50	54.00	6.90	6.65	8.70	8.35
9	19.00	18.50	54.00	6.90	6.65	8.72½	8.37½

New York

NEW YORK, Dec. 9.

Electrolytic copper is higher with the leading producers quoting and selling at not less than 18.50c., New York, for early delivery to regular customers, with Lake copper changing hands at 19c., New York, under the same conditions. There are some small interests which are understood to be shading these prices slightly. An interesting phase of the situation is that speculators and dealers are bidding as high as 19c. to 19.50c. for electrolytic copper and are successful in some cases. The tin market has been very quiet and sales have been exceedingly light. The value of sterling exchange has been the controlling factor and the spectacular advances in the London market have met with very little response on this side. On Dec. 8 the London market advanced over £5 per ton for spot tin which would call for at least an advance of 1c. per lb. in this market. The increase, however, was but ½c., spot Straits tin selling at 54c., New York. There have been no buyers for future shipment at 54.25c. The lead market is strong and higher. On Dec. 5 the leading interest advanced its price 15 points to 6.90c., New York, and 6.65c., St. Louis, which we quote as the market. Before this advance exceedingly good sales were made. As a rule independent sellers have very little lead to sell and curtailed production is beginning to be an important factor. Available supplies of lead the world over are diminishing. In sympathy with a considerably speculative market in London the zinc market here has continued to advance until prime Western for December and first quarter shipment is quoted at 8.37½c., St. Louis, or 8.72½c., New York. The export market is strong but the domestic demand is light. Antimony is slightly higher in a quiet market at 9.50c., New York, duty paid, and virgin aluminum is unchanged early delivery.

St. Louis

Old Metals.—The market is stronger. Dealers' selling prices are reported as follows:

	Cents per lb.
Copper, heavy and crucible	19.00
Copper, heavy and wire	18.00
Copper, light and bottoms	16.00
Brass heavy	13.00
Brass light	9.00
Heavy machine composition	18.00
No. 1 yellow rod brass turnings	11.00
No. 1 red brass or composition turnings	15.00
Lead, heavy	6.00
Lead, tea	4.50
Zinc	5.50

ST. LOUIS, Dec. 8.—The non-ferrous metal market has been quiet, but rather firmer toward the close of the week, with car-load lot quotations: 6.50c. for lead, and 8.30c for spelter. In less than car-load lots the quotations are: lead 7.25c; spelter, 9c; tin 62c; copper 21c; antimony 12c. In the Joplin mining district the market has been considerably upset by the fuel situation, and prices have been weaker with zinc blend quotations at $47.50 per ton basis of 60 per cent. Calamine and lead ore have been quiet and somewhat weaker in price. On miscellaneous scrap metals, we quote dealers buying prices as follows: Light brass 8c; light copper, 13c; heavy yellow brass, 10c; heavy copper and copper wire, 16c; zinc, 4c; lead, 4.50c; pewter, 35c; tinfoil, 43c; tea lead, 3c; aluminum, 22c.

In the Pittsburgh District

The American Sheet & Tin Plate Co. will erect girls' welfare buildings at its tin plate plants at New Kensington, Pa., and Chester, W. Va. The company is also receiving bids for the erection of a hosiptal at Scottdale, Pa.

The plants of the Whitaker-Glessner Co. at Wheeling, W. Va., and the Laughlin tin plate works of the American Sheet & Tin Plate Co. at Martins Ferry, Ohio, have been compelled to shut down on account of the coal strike.

The Weirton Steel Co., now building an open hearth steel plant at Weirton, W. Va., has placed a contract for a 40-in. 2-high reversing blooming mill with the Mesta Machine Co., Pittsburgh, while the contract for the reversing engine to drive the blooming mill was placed with the United Engineering & Foundry Co., Pittsburgh, and will be built at its Tod works at Youngstown, Ohio.

The National Malleable Castings Co., Sharon, Pa., will erect a new steel building, 300 x 100 ft., and will divert a part of its steel production into the making of steel anchor chains for ships. During the war the company specialized in this line of work for the Government.

Proposed Restoration of Pig Iron Rates from the South

The Ocean Steamship Co. and the Clyde Line have authorized the restoration of rail, water and rail rates from the Birmingham, Ala., pig iron producing district to New England points to a basis of $4.50 per gross ton to Boston and Providence plus the 25 per cent advance authorized by United States Railroad Administration General Order No. 42, which makes the rate $5.80 gross ton, and to interior New England points on a basis of $4.50 to the port, 40c. handling charges and 75 per cent of the local rate from the port to the delivery point, plus 25 per cent of the whole to comply with the General Order No. 42.

These freight rates have been authorized by the authorities, are in the hands of the printer and will become effective on one day's notice.

The Merchants & Miners Transportation Co. has refused to sanction the reduction in the freight rate.

Scrap Taken from Embargo List

WASHINGTON, Dec. 9.—Scrap iron and scrap steel have been removed from the British export embargo list, according to a cablegram received from Consul Robert P. Skinner at London.

Trade Commissioner C. E. Herrings has sent a report from Brussels concerning the conditions in Belgium which is trading with German producers. The Belgian Government has issued a decree removing the import embargo applicable to a large number of German products. These articles include: scrap iron, crude pig iron, padlocks and chains and registering and controlling apparatus for controlling machinery, rolling stock of all kinds, sewing machines, looms, and typewriters.

New Crucible Officers

PITTSBURGH, Dec. 9.—At a meeting of directors of the Crucible Steel Co. of America, Pittsburgh, held in that city on Monday, Dec. 8, O. H. Wharton declined to be a candidate for re-election as president and H. S. Wilkinson, who was elected chairman several months ago to succeed Herbert M. DuPuy, was then elected president. Vice-presidents were elected as follows: Dr. John A. Mathews, first vice-president; George E. Shaw, second vice-president and treasurer; J. W. Dougherty, third vice-president; R. H. Illingworth, fourth vice-president. H. F. Kress, who was formerly assistant secretary and assistant treasurer, was elected secretary to succeed George A. Turville, who resigned, and Mr. Kress also maintains the position of assistant treasurer.

Short Trade Items

The Edgar T. Ward's Sons Co., steel merchant, 3604 South Morgan Street, Chicago, has acquired a building site at 1455 West Thirty-seventh Street, and work has begun on the foundations of the new warehouse. The site has a frontage of 109 ft. and a depth of 542 ft. When completed the building will be three stories with total floor space of 77,000 sq. ft. The first floor will be at car level with a canopied platform along the service tracks. Plans call for a 5-ton elevator. At the rear of the main building will be a garage with 1900 sq. ft. of floor space. Construction is being done by the E. W. Sproul Co. The architect is S. Scott Joy.

The blast furnace of the Sharpsville Furnace Co., at Sharpsville, Pa., which has been idle for some months, was put in operation Nov. 10 on foundry iron. This furnace is owned and operated by the Allen S. Davison Co., Oliver Building, Pittsburgh.

The new $2,000,000 plant of the Crane Co. at Montreal is now ready to commence operations. This company will turn out all kinds of castings, and will manufacture all kinds of valves and fittings. This plant was designed to take care of the Canadian end of the business, which has reached very considerable proportions. It is understood that the company will open branch offices and warehouses in every province of the Dominion.

The recently organized American Instrument Works, 18 East Lacock Street, Pittsburgh, has opened a fully equipped machine shop for the manufacture of drawing tools, dies and jigs. The American Instrument Works specializes in the repairing of instruments and tools and is prepared to give service in the supply of special pieces and models in steel, brass, wood, etc. Special attention is devoted to the procuring and developing of patents as the company will furnish the drawing and do the experimental work.

To take over the business of the former partnership of Jones Bros., the Jones Structural Steel Co. has been formed at Ravenna, Ohio, with J. A. Jones, formerly of the Alliance Structural Steel Co., president. The company's plant, equipped for fabricating steel, will be enlarged. G. G. Jones, formerly of the Penn Bridge Co., Beaver Falls, Pa., is vice-president of the company and B. F. Jones is secretary.

The Webb Electric Furnace Corporation has opened offices at 30 Church Street, New York, and has taken over the manufacture and sale of the furnace developed by the Old Dominion Iron & Steel Corporation, Richmond, Va., where two of these furnaces have been in continuous operation for the past three years.

The Blaw-Knox Co., Pittsburgh, works at Hoboken, Pa., has placed an order for two 10-ton and one 20-ton 70-ft. span electric cranes with the Cleveland Crane & Electric Co., Cleveland, through its Pittsburgh office.

The Yale & Towne Mfg. Co., Stamford, Conn., voluntarily has increased wages of all its 5000 employees, whether employed by the week, piece work or in the office, 10 per cent. In July last an increase of 20 per cent in wages was made and the working hours were reduced from 55 to 50 hr. a week.

The Boston District Salvage Board Committee on Sales of Materials has sold 255,683 lb. of round steel bars to the Garden City Plating & Mfg. Co., Chicago, at $42.50 per net ton, f.o.b. South Boston.

To make substantial extensions to manufacturing facilities in the way of new buildings and equipment, the Truscon Steel Co., Youngstown, Ohio, is issuing $1,000,000 new preferred stock. President Julius Kahn says "the volume of business offered us during recent months has reached nearly 50 per cent greater than the busiest months in the company's history. Our new products, which a year ago were manufactured in an experimental way, met with greater demand than our ability to supply them."

The Youngstown Boiler Tank Co., Youngstown, Ohio, has increased its capital from $50,000 to $100,000.

Because of the steel strike, the wage distribution at Youngstown, Ohio, of $4,965,179 for October was $2,827,171 less than the September payroll.

The J. I. Case Plow Works Co., Racine, Wis., organized in Delaware with an authorized capital stock of $10,000,000 as a consolidation of the J. I. Case Plow Works and the Wallis Tractor Co., Racine, has elected the following officers: President, H. M. Wallis; assistant to the president, H. M. Wallis, Jr.; vice-president, L. N. Burns; treasurer, W. M. LaVenture; secretary, M. E. Erskine; auditor, G. A. Filer; cashier, G. H. Bolton; assistant secretary, Charles E. Pain, Jr.; directors, H. M. Wallis, L. N. Burns, W. M. LaVenture, M. E. Erskine, H. M. Wallis, Jr., W. C. Quarles, C. F. Glore, Henry R. Platt and William A. Tilden.

The Cuyahoga Spring Co. has moved into its new plant at 10252 Berea Road at Detroit Avenue, Cleveland.

At a recent meeting of the Engineering Club of the Greenfield Tap & Die Corporation, Greenfield, Mass., F. O. Wells, president of the corporation, gave a talk on what he saw during several months spent abroad.

The Barstow Stove Co., Providence, R. I., is issuing some first preferred stock, the proceeds from the sale of which will be used for the development of its business.

Virtually the entire manufacturing district of the Connecticut Valley is grouped into the Springfield, Mass. zone for the 1920 census of manufacturers. The Springfield district includes Hampton, Hampshire and Franklin counties with the exception of the town of Orange.

The Ohio Cutlery Co. has been organized with a capital of $75,000, and it is reported will build a plant at Massilon, Ohio, for the manufacture of cutlery.

W. K. Stamets has filed plans at Pittsburgh for the erection of a machine shop at an estimated cost of $16,000.

The General Tractors, Inc., a $1,000,000 corporation organized in Delaware to effect a merger of the Monarch Tractor Co. of South Dakota, with interests at Watertown, Wis., Paulsboro, N. J., and Brantford, Ont., will open executive offices in Chicago on Oct. 1, in the Old Colony Building, Dearborn and Van Buren streets. A New York office will be established at 25 Broad Street. The office at Watertown will be continued merely as a factory office and similar offices will be maintained at Paulsboro and Brantford.

House bill No. 8315, known as the Cost Mark bill, has been introduced into the House of Representatives by Representative Isaac Siegel of New York, providing that manufacturers, jobbers or retailers doing business in the United States be required to mark in plain figures with the actual cost price, all merchandise offered for public sale. The "true actual cost price" specified in this act does not include any drayage, freight or carriage charges paid by purchaser nor any discount allowed on bills paid before maturity. A fine not exceeding $5000, or not over two years' imprisonment, or both, may be the penalty for violation.

The Independent Pneumatic Tool Co., 600 West Jackson Boulevard, Chicago, recently held its annual sales meeting attended by company officials and Northern, Southern, Eastern, Western and Canadian sales managers. The meeting was in charge of vice-president and general sales manager, R. S. Cooper. Among the officials of the company present were: John D. Hurley, president; F. W. Buchana, secretary; F. B. Hammerly, works manager; Axel Levedahl, consulting engineer.

It is planned to increase the commercial relations between the United States and Spain by the establishment of a commercial technical bureau devoted both to industrial studies and trade representations. With this in view a corporation is to be formed by Gregorio Prados Urquijo, attorney, secretary of the committee in the plant, Altos Hornos De Vizcaya (blast furnaces of Vizcaya) and director of the Siderurgic Syndicate; Luis de Garayzabal,

engineer in the iron and steel plant, Sociedad de Mieres, delegate to the Siderurgic Syndicate, and Leandro de Amilivia, Serrano 3, Madrid, delegate to the iron and steel plants, Sanpedro de Elgoibar and Santa Ana de Bolueta, secretary of the Siderurgic Syndicate and director of the Screw Manufacturer's Syndicate.

Communications are invited from American manufacturers of chemical products, electrical implements, tools, machine tools, industrial patentees, etc.

Firms interested are referred to the American Consul in Spain or any similar institution. Leandro de Amilivia should be addressed.

A course of 30 lectures on employment problems, including practice in selecting employees, fatigue study, sanitation and hygiene, accident prevention, lunchrooms, training methods, plant publicity, suggestion systems, wages and hours of work, promotions, supervising employees, forms and records, union labor, discipline, and work committees, has been added to the courses given at the New York University School of Commerce, Accounts and Finance, 32 Waverly Place, New York, under the instruction of J. D. Hackett, labor consultant.

Hunter & Havens, Bridgeport, Conn., iron and steel jobbers, have again increased their facilities and are completing a new warehouse and office building, 80 x 250 ft. at South Avenue and Water Street. The structure is spanned by Case electric cranes and railroad siding connects with the warehouse.

The Hoffman Heater Co., manufacturer of all kinds of gas fired water heaters, is building a new plant at Lorain, Ohio. The new building will be ready in about 30 days, and is being constructed of brick, steel and glass. Material and machinery have been purchased.

The Aetna Foundry & Machine Co., Warren, Ohio, has received orders for complete tinning units for tin plate from France and Japan.

The Nelson Blower & Furnace Co., Elkins Street, South Boston, Mass., is building a structure, 90 x 300 ft., for the assembly of its tractors. The steel framework is to be covered with galvanized sheets.

The Allegheny Gear Works, Pittsburgh, has completed a new factory, and is now in a position to furnish spur, bevel, spiral and worm gears in a wide range of sizes and designs. E. L. White is chief engineer and W. H. Thompson is in charge of sales. The equipment of the company is especially suited to the manufacture of tractor gears and parts. It includes, in addition to the usual shop equipment, bar and chucking turret lathes, Fay automatics, gear hobbers, Fellows shapers, bevel gear generaters, broachers, internal and external grinders and a complete case hardening and heat treating plant.

Arthur G. McKee & Co., Cleveland, have taken a contract for a furnace top, scale cars and skip cars of the blast furnace of the Thomas Iron Co., Milwaukee.

The Canton Sheet Steel Co., Canton, Ohio, a few days ago dedicated a new office and welfare building. A dinner was served at which the employees were guests of the management, after which entertainment was provided. The building includes a large auditorium for the use of the employees and a general store for the exclusive patronage of men employed.

The Fibre Barrel Machinery & Mfg. Co., 2516-28 Jane Street, S. S., Pittsburgh, has changed its name to the Enterprise Machine Co. at the same address.

The Leonard Foundry Co., Salem, is nearing completion, and will give employment to 30 molders. Peter Leonard is owner, and a general jobbing business in gray iron castings will be carried on.

The Marine Castings Co., 116-123 Fifty-seventh Street, Brooklyn, N. Y., recently took over the plant and equipment formerly occupied by the Delta Foundry & Machine Corporation, for whom J. F. Shea has been employed as manager and foreman. This new company is a co-partnership with $50,000 capital.

Interesting studies of the properties of alloys have been completed by the Bureau of Standards, Washington, D. C. Among the latest announcements of these studies are papers covering tests of "The Mechanical Properties and Resistance to Corrosion of Rolled Light Alloys of Aluminum and Magnesium with Copper, with Nickel and with Manganese" (Technologic Paper No. 132) and "The Behavior of Wrought Manganese Bronze Exposed to Corrosion While Under Tensile Stress" (Technologic Paper No. 135).

The exports of iron from Spain during the first four months of 1919 aggregated only 1,252,672 metric tons, as against 1,443,924 tons in the corresponding four months last year.

For a bridge of say 400 or 500 tons, which could be erected today for 6 cents per pound, as much as 8c. was paid during the war.

Permission has been granted the Reznor Manufacturing Co., Mercer, Pa., to ship gas heaters into Great Britain and the company plans to immediately ship 5,000 stoves to England. Eventually a factory will be built in Great Britain to provide for European demand.

The largest all-water route shipment of power steel wire from overseas for St. Louis since the beginning of the war has arrived via the Federal Barge Line, consigned to the Broderick & Bascom Rope Co. The shipment originated at Liverpool and was transferred at New Orleans to the Government barge line running between New Orleans and St. Louis.

Codes governing the arrangement of lighting in industrial plants are in process of compilation in the States of Wisconsin, New Jersey, New York, Ohio and California.

The General Railway Signal Co., Rochester, N. Y., has plans for increasing its tonnage capacity, which now averages 115 tons per month, by the installation of additional steam drop hammers from 1500 to 4000 lb. and board drop hammers from 600 to 2000 lb. and other drop forging equipment. The company handles forging from 4 oz. to 50 lb., including firearms, dental instruments, automobiles, trucks, tractors, and does heat treating and machining.

The Domhoff & Joyce Co., Cincinnati, with branch offices in other large cities, has been appointed exclusive sales agent for the Mid-Continent Iron Co., Kansas City, Mo. The Mid-Continent company has a plant at Midco, Mo., having a daily capacity of 100 tons of warm blast charcoal iron. In addition the company recovers a number of by-products, including wood alcohol.

The plant of the Knox Motors Co., Springfield, Mass., has been sold to Neil R. Sinclair of New York, president, Militor Motors Corporation. The Knox company reserves the right to use a part of the buildings for a period of two years to manufacture its present products and parts for its former models.

Joseph T. Ryerson & Son have purchased a block at Fifteenth and Rockwell Streets and Ogden Avenue, Chicago, adjoining their Chicago warehouses. The property was owned by the Crane Co. and is improved with a brick foundry building.

P. G. Taylor has been named assistant treasurer of the Savage Arms Corporation, Sharon, Pa., in charge of accounting in the general offices.

M. Cokley has been appointed superintendent of the Taylorville, Ill., foundry of the Kincaid Railway & Mine Supply Co., succeeding C. B. McGrath, resigned.

William Barrett has resigned as foreman of the pressed steel department of the Savage Arms Corporation, Sharon, Pa.

Frederic A. Parkhurst, organizing engineer, announces the opening of offices in New York at 2611 Grand Central Terminal Building.

R. S. Stokvis et Fils, S.A., of Paris, France, whose New York office is at 17 Battery Place, have purchased a modern building on the Rue de Petits Hotel, Paris. This structure was designed and built as a machine-tool and small tool sales building and affords ample space for demonstrating machines under belt; also storage space and office space. The building will be occupied, after renovation, early in 1920.

PERSONAL

On the occasion of his first extended vacation in 40 years, David Davis, secretary-treasurer of the Ohio Iron and Steel Co., and for many years manager of the Mary blast furnace at Lowellville, Ohio, purchased by the Sharon Steel Hoop Co., from the Ohio Iron and Steel Co., was presented a silver loving cup by associates. M. C. Schultz, chief clerk at the furnace, made the presentation. Mr. Davis has been 40 years with the Ohio Iron and Steel Co.

W. H. Blake has resigned as electrical engineer of the Universal Steel Co., Bridgeville, Pa., and will engage in business on his own account.

John H. Dwight, Racine, Wis., has resigned as vice-president and general manager of the Belle City Malleable Iron Co., effective Jan. 1, to become associated with the Saginaw Products Co., Saginaw, Mich., division of the General Motors Corporation, as assistant general manager. Mr. Dwight went to Racine from Chicago in 1904 and, with the exception of five years of service for the Racine Rubber Co. and Mitchell Motors Co., has been connected with the Belle City Malleable Iron Co. and its affiliated concern, the Racine Steel Castings Co. He was elected vice-president and general manager in 1912.

Earl E. Beveridge has been appointed works manager for the Federal Corporation, Westfield, Mass., manufacturer of spark plugs and other products. Mr. Beveridge was with the Westinghouse Electric and Manufacturing Co. at East Pittsburgh for about 12 years in various capacities, including chief cost clerk. He was later employed by the New England Westinghouse Co. as a cost and production expert, and by the Springfield Aircraft Corporation as comptroller and assistant general manager.

C. E. Beeson, secretary of the Pittsburgh Steel Co., Pittsburgh, has been elected a director of the Duquesne National Bank of that city, succeeding Wallace H. Rowe, deceased.

Harrison Loring, purchasing agent of the Virginia Shipbuilding Corporation, Alexandria, Va., has resigned and has been succeeded by H. C. Russell.

H. A. Hoffer, United States Cast Iron Pipe and Foundry Co., addressed the Engineers' Club of Philadelphia on the evening of Dec. 9 on the "Manufacture and Uses of Cast Iron Pipe."

James R. Conrad sailed Dec. 4 for Singapore to represent the Truscon Steel Co., Youngstown, Ohio, through the United Engineers, Ltd., in the Malay Peninsula and Siam. He entered the engineering department of the company in 1914. He won a lieutenant's commission in the war, serving in Europe.

P. J. Walsh has resigned as mine inspector of the ninth bituminous district with headquarters in Connellsville, Pa., and has become general superintendent of mines for the Consolidated Coal and Coke Co., Uniontown, Pa.

Frederick H. Korff recently became factory manager of the plant for the manufacture of gages purchased by C. E. Johansson, Inc., at Poughkeepsie, N. Y. Mr. Korff, who is a Pratt Institute and Columbia University man, is a consulting engineer and author of articles in trade journals. He has held the positions of factory manager for H. C. Hinchcliff, Inc., production manager and mechanical engineer of the Frank S. Betz Co., assistant general superintendent and production manager of the Stromberg Carburetor Co., and more recently as assistant factory manager in the several plants of the Wright-Martin Aircraft Corporation.

George S. Vail, sales manager for Arthur G. McKee & Co., Cleveland, sailed from New York on the S. S. Adriatic, Nov. 29, for England, where he will spend several months on business for his company in connection with the installation of modern blast furnace and steel plant equipment. Mr. Vail was accompanied by George Garrett, who will establish an office and remain in England permanently as the English representative of Arthur G. McKee & Co.

The Pittsburgh Rivet Co., Pittsburgh, has been reorganized, its officials now being as follows: W. J. Reitz, president; J. H. Reitz, vice-president; J. F. Lehrian, treasurer; Roy A. Reitz, secretary.

C. W. Parker has been appointed resident representative at Cincinnati for the Abell-Howe Co., Chicago, with offices in the Greenwood building. Through this office, southern Ohio, Indiana and Kentucky territory will be served with particular reference to power transmission and conveying chains, and materials handling equipment.

Herbert DuPuy, formerly chairman of the Crucible Steel Co. of America, recently underwent a second surgical operation in a hospital in New York and is reported to be progressing favorably.

H. H. Harris, formerly general sales manager for the Swedish Crucible Steel Co., has been appointed manager for the department of heat-treating equipment of the Quigley Furnace Specialties Co., 26 Cortlandt street, New York. Mr. Harris has devoted several years to the practical application of materials for heat-treating purposes, especially to steel mixtures and special alloys for carbonizing and annealing boxes, cyanide pots, etc.

William A. Folger, second vice-president Berger & Carter Co., canner's machinery, San Francisco, has severed his connections with that company after 18 years' service and will go into business for himself as direct representative of machinery houses. He is making his temporary headquarters at room 306, Cunard Building, and after a trip east in January will establish a permanent office in San Francisco.

J. Allen Dillon has been made manager of sales of a new office just opened at 50 East Forty-second street, New York, by the Pittsburgh Screw & Bolt Co., Pittsburgh.

W. J. Riley, formerly buyer of machinery, tools, etc., for the Covert Gear Co., Lockport, N. Y., has become efficiency engineer for the Dittmer Gear and Manufacturing Corporation, Lockport.

Officers of the Lumen Bearing Co., Youngstown, Ohio, were elected Dec. 3 as follows: William H. Barr, president and treasurer, C. H. Bierbaum, vice-president, and N. K. B. Patch, secretary. In addition to the officers the following were chosen directors: Thomas Parrock, H. B. Parrock, Kester Barr, L. B. McKelvey, J. F. Bonnell, and B. G. Parker. The company is now building unit A of its new plant in Poland Avenue, Youngstown, a building 105 x 140 ft. Bearings of an improved type will be manufactured and it is expected to commence production April 1.

Gustav Botin, salesman at the Allied Machinery Co. of Paris, is now connected in the same capacity with J. Horsmann, Paris.

C. T. L. Edwards has resigned as superintendent of blast furnaces of the Bethlehem plant of the Bethlehem Steel Co. He entered the employ of the Bethlehem Steel Co. in 1912, becoming superintendent of blast furnaces in June, 1918. He is succeeded by G. H. Hohl, formerly assistant superintendent of blast furnaces.

Leopold Tschirky, who has been assistant purchasing agent of the Bethlehem Steel Co., Bethlehem, Pa., has resigned to become connected with the General Refractories Co., at Philadelphia. Upon his graduation from Cornell University in 1912, Mr. Tschirky went to the Bethlehem Steel Co., where he worked for a period in the machine shops and transportation department, being transferred in Dec., 1914, to the purchasing department in charge of the purchase of all raw materials, machine tool, mill industrial and electrical equipment, as well as all construction and construction materials.

H. N. Holdren of the Pittsburgh-Des Moines Steel

Co. has been elected president of the Traffic and Transportation Association of Pittsburgh. Other officials elected are J. F. Strum, of the National Tube Co., treasurer; S. R. Hosmer of the Jones & Laughlin Steel Co., vice-president; A. C. Schweitzer of the Carnegie Steel Co., recording secretary; S. C. Corfield of the Columbia Steel and Shafting Co., financial secretary; H. B. Parmalee of the Carnegie Steel Co., custodian.

Joseph G. Butler, Jr., vice-president of the Brier Hill Steel Co., Youngstown, Ohio., and a director of the American Iron and Steel Institute, sustained a fractured rib and other minor injuries when struck by an automobile, Dec. 5. His injuries are not serious.

OBITUARY

L. H. Treadway

LYMAN H. TREADWAY, president The Peck, Stow & Willcox Co., Cleveland, and Southington, Conn., died at his home in Cleveland, Dec. 7, of heart disease after an illness of one day, aged 57 years. He was born in New Haven, Conn., March 27, 1862, but went to Cleveland shortly after his father, Augustine R. Treadway, had located in that city in 1880, and had organized the Willcox-Treadway Co. to manufacture hardware and mechanics' tools. His son was given employment in that company's plant as a packer, and learned the business from the ground up. Later the company was merged with The Peck, Stow & Willcox Co., at that time having plants at Southington, Plantsville, East Berlin and other nearby places. The company celebrated its 100th anniversary Aug. 29 and 30 last at its Southington plant with elaborate and fitting ceremonies. Mr. Treadway was actively associated with the company from his boyhood days, advancing to the presidency in 1911 when his father retired. The latter died a few months later. Mr. Treadway was one of the most prominent citizens of Cleveland, and was closely allied with the city's financial interests and actively associated in various organizations. At the time of his death he was vice-chairman of the Federal Reserve Bank of the fourth district. He was president of the Cleveland Chamber of Commerce 1907-8.

ALEXANDER H. BOVARD, western sales manager of the Blaw-Knox Co., Pittsburgh, died at his home in the East End, Pittsburgh, on Friday, Nov. 28. He was born in Pittsburgh and was educated in the old Fourth Ward School, Allegheny, and in Park Institute and Western University of Pennsylvania. He was with the Riter Conley Mfg. Co. from 1897 to 1912, retiring from that company as chief engineer of the structural department to assume the same position with the Blaw Steel Construction Co., now the Blaw-Knox Co. He was a prominent structural engineer and was a pioneer and an authority in developing steel towers for power transmission.

JAMES J. SULLIVAN, who for a long time was identified with the steel and iron business, died Dec. 1, at the Charlesgate Hospital, Boston, after an illness of about a month. Mr. Sullivan's business address was room 34, 70 Kilby street. He made his home at the Boston City Club. About a month ago he went to the hospital and underwent a serious surgical operation from which he never rallied. He was born in Boston 67 years ago. Early in life he was employed at the Cunningham Boiler Works, Charlestown, Mass., and subsequently became a successful salesman. Some years ago he became the New England agent for the Champion Rivet Co., Cleveland, and did a large business in iron and steel as well.

MILES E. LEIGHTON, aged 60 years, died at his home in Wilkinsburg, Pa., on Monday, Dec. 1, from pneumonia. For 19 years he had been erecting engineer for the Allis-Chalmers Co., Milwaukee, having been previously connected in the same capacity with a Chicago firm. His specialty was the erection of engines for steel plants in the United States and South American countries. He recently returned from Porto Rico.

American Foundrymen's Association May Meet in Newark Next Year

The Gray Iron Club of New York and the Metropolitan Brass Association of New York were guests of the Newark Foundrymen's Association, Newark, N. J., at the Down Town Club in that city the evening of Dec. 3. A turkey dinner was followed by an address by A. O. Backert, past-president American Foundrymen's Association, on "Some Recent Experiences in England and France," based upon the speaker's recent trip to those countries. There was an attendance of 110. The representatives of the three organizations present voted that they were in favor of having the 1921 convention of the American Foundrymen's Association held in "the metropolitan district," embracing New York, Brooklyn, Jersey City, Newark and other near-by cities, the meetings to be held preferably in Newark, provided hotel and other accommodations prove adequate.

A. N. Peterson, Brooklyn, president Gray Iron Club, gave a short talk in which he commented upon the lack of harmony among foundrymen in the past and the recent realization of the need for getting together. Frederick H. Landolt, president Metropolitan Brass Association, said that his organization had been in existence a year, and he outlined its progress, telling of the introduction of cost systems among its members. Two new members were admitted into the Newark Foundrymen's Association: American Foundry Co. and E. Arthur Tutein. A. E. Barlow, Barlow Foundry, Inc., president of the local foundrymen's organization, presided.

Structural Business at Milwaukee

The Worden-Allen Co., Milwaukee, has taken the contract to furnish between 800 and 900 tons of reinforcing bars for the construction of a $1,000,000 food products plant for the Uihlein Bros., Milwaukee.

Kenosha, Wis., has rejected all bids taken in September for the construction of a Strauss bascule bridge at Main Street. The lowest bid was $415,000, entered by the Edward E. Gillen Co., Racine and Milwaukee. The board of public works will take new bids next spring. B. C. Brennan is city engineer.

Bids are being taken by the A. O. Smith Corporation, Milwaukee, for the second unit of its extension program, 4750 tons.

Contracts awarded recently to the Worden-Allen Co. are: A. O. Smith Corporation, Milwaukee, manufacturing extension, 4500 tons; Newport Co., Carrollville, Wis., new buildings and general alterations, 400 tons; Cleveland-Cliffs Iron Co., Hibbing, Minn., ore washing plant, 300 tons; Thomas Furnace Co., Milwaukee, skip hoist and ore bin, 300 tons; Pfister & Vogel Leather Co., Milwaukee, hide house, 500 tons; American Skein & Foundry Co., Racine, Wis., manufacturing building, 175 tons.

Brass Manufacturers Meet

The National Association of Brass Manufacturers held its annual meeting at the Hotel Astor, New York, Dec. 5. Committees met morning and afternoon of Dec. 4. The meeting was addressed by William J. Wooley, director of the National Trade Extension Bureau, and Andrew Phelps, secretary United States Chamber of Commerce. The following officers for the year were elected: H. M. Gillette, Pittsburgh, president; R. H. Smith, Springfield, Mass., and A. C. Sanders, Chicago, vice-presidents; W. M. Webster, Chicago, secretary-treasurer.

Operators Appeal to the Government

UNIONTOWN, Pa., Dec. 9.—Several smaller operators in the Connellsville region have appealed to Director General of Railroads Hines for relief, declaring they face bankruptcy unless they can secure immediate payment for coal seized by the Government and diverted to other than the original consignees. It is declared that these operators are being forced to wait weeks for payment for their coal and consequently are unable to meet their payrolls and other obligations.

Machinery Markets and News of the Works

TOOL PLANTS SHUT DOWN

Two in Central West Cease Operations Owing to Fuel Shortage

Other Machine-Tool Manufacturers Are Seriously Affected—Demand for Equipment Continues Good

Even before the drastic order of the Fuel Administration issued Monday, restricting manufacturing operations to three days a week, the fuel shortage had hit the machine-tool industry, particularly in the Central West, where two plants were shut down completely last week, while others had curtailed production.

Notwithstanding the perplexities of the present industrial situation, the demand for machine tools continues unabated. Deliveries are being further extended and this has resulted in some haste on the part of manufacturers to get their requirements placed so as to insure the earliest possible deliveries.

Price advances are again noted, some tools now selling at higher than during the period of the war. Some manufacturers of power presses, boring mills, planers, universal grinders, engine and precision lathes have advanced prices about 10 per cent. One line of heavy duty drilling machines has been correspondingly advanced, and a maker of turret lathes has announced a new price 7½ per cent higher.

The General Electric Co. is one of the most active buyers and its inquiries are being figured on in several centers. Purchases will be made for new plants at Rochester, N. Y., and Decatur, Ind. The Willys Corporation, Elizabeth, N. J., continues to buy tools on a fairly large scale. There is a large inquiry in the New York market for a naval air station in Greece. The Newport News Shipbuilding & Dry Dock Co. is inquiring for 25 or 30 tools in the Philadelphia and New York markets. The Nathan Mfg. Co., New York, has issued an inquiry for 25 to 30 lathes, milling machines, shapers, etc. The Farrel Foundry & Machine Co., Ansonia, Conn., is inquiring for 72 tools.

At Cleveland there is a large inquiry from the Goodyear Tire & Rubber Co., Akron, Ohio, for equipping a rim plant and machine shop. Among other tools 19 boring mills are inquired for. The Simmons Co., Kenosha, Wis., has been a large buyer in Chicago. The Climax Engineering Co., Clinton, Iowa, has a small list out.

New York

NEW YORK, Dec. 9.

Despite the unsettling effect of the coal situation upon industry, the demand for machine tools and allied equipment continues exceptionally good. This is due in large part, however, to the fact that deliveries on most well-established lines of tools cannot be had short of two to four months and manufacturers are looking ahead to a continued large demand for their products when the atmosphere has cleared. The sold-up condition of many of the machine-tool plants has stimulated a demand for second-hand machinery which some dealers describe as being of almost war proportions. There is a fairly plentiful supply of small and medium-sized tools, but of large tools there is a great scarcity. One dealer, for example, has been searching the country, without success, to find a used horizontal boring mill, floor type, with a 5 or 6 in. bar.

Inquiries for new machinery are being received by the New York trade at a very fair rate. Sales of machines are in most cases in excess of output. For example, one plant which produces about 170 machines of a certain type per month received orders in November for about 200 of these machines. The same thing, in varying degree, is being duplicated in scores of plants. Prices are stiffening, and many machine tools are now being quoted at prices higher than were asked during the war. A well-known turret lathe has been advanced 7½ per cent, effective at once.

The General Electric Co. is one of the most active buyers. Its latest inquiry calls for 27 upright drilling machines, but considerable more equipment of various types will be required for the company's new plants at Rochester, N. Y., and Decatur, Ind. At the latter plant a large contract for small motors will be filled.

The Willys Corporation, Elizabeth, N. J., continues to buy for additions to its plant, and later on it is expected that a list of tools will be built for the Electric Auto-Lite Co.'s plant at Poughkeepsie, N. Y., which is a unit of the Willys organization. The New Departure Mfg. Co., Bristol, Conn., which was mentioned last week as having purchased about $1,000,000 worth of equipment, of which about $600,000 worth was bought from one company, still has some machine tools to buy, particularly for its coaster brake department, its recent purchases having been for the ball-bearing department.

Among other companies which are active in the market are the Nathan Mfg. Co., New York, which has received quotations on 25 to 30 lathes, milling machines, shapers and other tools; the De Laval Cream Separator Co., Poughkeepsie, N. Y., which is adding to its equipment; the Air Reduction Co., New York, which has bought a small lot of tools for its Jersey City plant, and the Mergenthaler Linotype Co., New York, which has a list of 15 to 20 tools, on which bids are being obtained.

Export trade is not particularly active, but a fair demand for machines is coming from the Far East and South American countries. An officer of the Royal Hellenic Naval League of Greece is in this country to confer with Alfred Herbert, Ltd., with regard to complete equipment for a naval air station in Greece. This list was first figured on in England, but owing to the high prices for machinery prevailing there a portion, at least, of the business may come to the United States.

The Standard Oil Co. of New York has inquired for two vertical boring mills for its Long Island City plant.

The crane market is much slower than it has been for some time past. Several large orders are pending, but sales are small and chiefly for light cranes. Few domestic inquiries are in the market and export inquiries have dropped off considerably. Crane manufacturers are expecting present conditions to prevail until the first of the year. Although the Pan-American Terminal & Dock Co. recently made inquiries for 34 cranes for the two docks at Staten Island, which it is to lease from the city of New York for 30 years, recent changes in the contract are said to place the purchases of these cranes in the hands of the city. The cranes will be of about 3-ton capacity. The Wharf and Dock Commission of Beaumont, Texas, is contemplating the purchase of several additional cranes for the city wharves. The Phelps-Dodge Co., building a new smelter at Bisbee, Ariz., will be in the market shortly for about 15 cranes, ranging from 20-ton to 50- and 60-ton. The Hart-Parr Co., Charles City, Iowa, is inquiring for a crane for scrap handling. The Barge Canal Commission has an inquiry out for four 3-ton jib cranes for Brooklyn. Westinghouse, Church, Kerr & Co., New York, are inquiring for three 3-ton electric cranes, 48-ft. span, for the John Simmons & Co. plant. The industrial department of the United States Navy Yard at Portsmouth, N. H., is in the market for a 5-ton, steam, tower crane, with 47-ft. radius and 35-ft. clearance, for 15-ft. gage track. In the export field, a manufacturer has an inquiry for two 10-ton hand power cranes from Ecuador, and through an exporter an inquiry is in the market for one 30-ton radial crane with 57-ft. span and a 68-ton radial crane.

Henry C. Griffin & Co., Inc., New York, operating a millwrighting shop at 143-45 Varick Street, has acquired property at 61-63 Vandam Street, extending through to Charlton Street, about 50 x 200 ft., as site for two four-story buildings for its own use.

Frank P. Green, Inc., New York, has been incorporated with a capital of $50,000 by C. W. Green, M. H. Grae and G. L. English, 60 Wall Street, to manufacture sewing machines and parts.

The Standard Button Machine Co., New York, has been incorporated with a capital of $100,000 by H. P. Livermore, J. H. Griswold and A. P. Nevin, 30 Church Street.

The Couch-Haas Motors Corporation, 1537 Bedford Avenue, Brooklyn, manufacturer of automobile parts, etc., has awarded a contract to Louis Gold, Court Street, for a two-story factory, 80 x 185 ft., at Henry and William streets, Long Island City, N. Y.

The Certain-Teed Products Corporation, 233 Broadway, New York, manufacturer of roofing, etc., with plant at St. Louis, Mo., has been negotiating with the Chamber of Commerce, Perth Amboy, N. J., for the establishment of a new branch plant in that section.

The Gordon Radiator Co., 154 West Eighteenth Street, New York, has construction under way on a two-story concrete plant, 100 x 262 ft., on Wales Avenue, near 143d Street, to cost about $60,000.

The Hemco Electric Mfg. Co., New York, has been incorporated with a capital stock of $100,000 by A. M. Bergenthal, G. Price and W. S. Allen, 55 East Sixty-fifth Street, to manufacture electric supplies and equipment.

The Begley Mechanical Corporation, New York, has been incorporated with a capital of $300,000 by W. J. Begley, E. W. Ernst, Jr., and F. P. Hennessy, 200 West Twenty-third Street, to manufacture electrical products.

The New York & Queens Electric Light & Power Co., 444 Jackson Avenue, Long Island City, will build a one-story automobile garage and repair works, 38 x 100 ft., for company trucks and cars, on South Padde Street, near Jane Street, to cost about $150,000, including equipment.

The Paul Wenger Corporation, New York, has been incorporated with a capital of $250,000 by A. E. Cohen, M. Sack and H. W. Fisher, 152 Second Avenue, to manufacture iron and steel products.

The Cox Brass Mfg. Co., Van Woert and North Pearl streets, Albany, N. Y., manufacturer of brass automobile specialties will build a two-story addition, 38 x 46 ft.

The Adirondack Machine Co., Whitehall, N. Y., has been incorporated with a capital stock of $20,000 by D. E. Brett, J. J. Doran and E. M. Finch to manufacture machinery and tools.

Fire, Nov. 21, destroyed the foundry and forge shop at the State prison, Ossining, N. Y., with loss, including equipment, reported at $200,000.

B. Hennessey, New Scotland Avenue, Albany, N. Y., has had plans prepared for a one-story machine shop, 124 x 150 ft., at 252-60 Bradford Street, to cost about $40,000.

The Magnolia Metal Co., 115 Bank Street, New York, has had plans prepared for a new plant at Elizabeth, N. J.

The Millville Cast Iron Products Co., 135 East Main Street, Millville, N. J., will build a new one-story foundry, 50 x 150 ft., at Eighth and Railroad streets. A one-story crane building, 75 x 150 ft., to cost $25,000, will also be erected.

The Rydon Tire & Rubber Corporation, Asbury Park, N. J., recently incorporated with a capital of $750,000, has acquired a local site for its proposed plant, to be erected on the unit plan, with first unit of 250 automobile tires and tubes per day capacity. Lionel Emdin, Deal, N. J., former president, the Delion Tire & Rubber Co., Trenton, is president, and Edgar T. Haaren, Asbury Park, is treasurer.

The Elco Co., Avenue A, Bayonne, N. J., manufacturer of motor boats, launches, etc., has filed plans for a concrete and steel addition to cost about $45,000.

Baker & Co., Inc., 54 Austin Street, Newark, N. J., manufacturer of platinum, etc., has filed plans for improvements to cost $90,000.

The Simon-Gartler Corporation, 240 Livingston Street, Newark, N. J., has been incorporated with a capital stock of $125,000 by Samuel Gartler, Henry Wasserman and Harry Bennet, to manufacture metal skylights, cornices, etc.

The Eastern Foundry Co., 152 Main Street, South River, N. J., recently incorporated with a capital stock of $350,000 and affiliated with the company of same name operating a plant at Jamesburg, is planning for a new foundry on a local site. The plant will aggregate about 40,000 sq. ft., and is estimated to cost $100,000. It will specialize in the production of piano plates and similar castings, with equipment to give employment to about 200 men.

The Sinclair Oil & Refining Corporation, 120 Broadway, New York, has acquired property aggregating about 442 acres of land at Linden, N. J., in the Tremlay Point district, fronting on Staten Island Sound, as a site for a new oil refinery.

The Standard Ordnance Corporation, 115 Broadway, New York, has acquired the plant heretofore occupied by the National Carbon Co., Carbon Place, Jersey City, N. J., for a branch works.

The Diamond Electric Specialties Corporation, 27 West Twentieth Street, New York, manufacturer of batteries, flashlights, etc., has acquired a three-story factory at 101-103 South Orange Avenue, corner of Richmond Street, Newark, N. J., 65 x 100 ft., for a new works. The new owner will take possession early in January. Frank M. Rosenfeld is president.

The Divine Brothers Co., Utica, N. Y., metal finishing engineer and manufacturer of metal-finishing equipment, has increased its capital stock from $500,000 to $1,000,000 to take care of its increasing business. It has purchased additional property, and as soon as building conditions will warrant, it expects to erect a large plant addition. B. H. Divine is president.

The I. H. Dexter Co., 27 Walker Street, New York, manufacturer of flexible couplings, has removed its works to its new factory at Goshen, N. Y., where output will be more than doubled.

The Electrical Copying Machine Corporation, New York, has been incorporated with a capital of $125,000 by J. Baum, H. Steingard and A. A. Walter, 120 Broadway, to manufacture electric-operated machinery.

The Ofeldt Gas Fired Boiler Co., Nyack, N. Y., has been incorporated with a capital stock of $100,000 by M. V. Bryant, E. G. and F. A. Ofeldt, to manufacture boilers.

The McEwen Tire Ventilator Co., New York, has been incorporated with a capital stock of $100,000 by P. D. Rollhaus, T. H. Anderson and T. C. Russ, 233 Broadway, New York.

The Fine Wire Insulating Co., Albany, N. Y., has been incorporated with a capital stock of $10,000 by M. D. Shiverick, F. H. and D. H. Tyler, to manufacture wire and wire insulation products.

William B. Elliott & Son., Inc., Garwood, N. J., has been incorporated with a capital stock of $10,000 by William B. Elliott, William B. Elliott, Jr., and George A. Elliott, to manufacture electric welding equipment.

The Standard Tool & Machine Co., Newark, N. J., has been incorporated with a capital stock of $50,000 by Adam Jacobus and Aomauld Stagerwald, to manufacture tools and machinery.

The New Jersey Blower & Mfg. Co., 187 Ogden Street, Newark, N. J., has filed notice of organization to manufacture blower systems and sheet-metal products. A. J. Leitch and William H. Shea head the company.

The Northern New York Foundry & Machine Co., Glens Falls, N. Y., has increased its capital stock from $25,000 to $50,000.

The Empire Tube & Steel Corporation, New York, has been incorporated by G. C. Sprague, A. H. Haaren and H. V. Crawford, 120 Broadway, to manufacture iron and steel products.

Catalogs Wanted

Gillespie Brothers & Co., 11 Broadway, New York, desire catalogs in heavy hardware lines for a client in the West Indies.

New England

BOSTON, Dec. 8.

Machine-tool buying in large lots has fallen off and the market is quiet. A good business, however is noted in single machines. The General Electric Co., United Shoe Machinery Co. and others have signified their intention of holding, until 1920, orders for equipment. This policy is not based on expectations of lower prices, but largely on the uncertainty due to the coal situation. The Stevens-Duryea Co., Chicopee, Mass., has bought gages and other preliminary equipment, but probably will not purchase machine-tools until late this month or January. The American Radiator Co. is undecided whether to build its new Boston warehouse or manufacturing plant first, a decision largely depending on its ability to get raw materials. The Boston & Albany Railroad the past few days bought some equipment, but the New England railroads as a whole are not in the market. Less activity is noted for second-hand machines, but the market is by no means quiet and prices hold well.

Activity in the textile machinery industry continues. One of the largest concerns in the State, finding its capacity inadequate to the demand, has placed orders for machinery with outside interests. The G. N. Goodspeed Machine Co.,

Winchendon, Mass., has just bought a lathe and is in the market for other equipment. The company is sold ahead for about a year and is contemplating the erection of a new factory. The United Drug Co. is buying mixing and other machines for its new Western plant. The cutting off of sugar supplies has caused a slowing up in the buying of machines by candy manufacturers. The Worthington Pump & Machinery Corporation has bought additional equipment for its Dean Works, but has not completed its purchases. The Pittsburgh office of the Westinghouse Electric & Mfg. Co. is still buying equipment for its East Springfield plant, having contracted for several lathes the past week. The Brown & Sharpe Mfg. Co., Providence, R. I., has recently bought a small amount of equipment. The Bosch Magneto Co., Springfield, Mass., has placed orders for four special double-end lathes and considerable other equipment. It is far behind on deliveries. The Northway Motor Co., Natick, Mass., has just bought six lathes and miscellaneous machines for its new factory now in course of erection, but has not covered all its requirements. It is producing about five cars per week. The Whitney Machine Co., Winchester, Mass., manufacturer of leather machinery, has contracted for several upright drills. The Gillespie Mfg. Co., Lowell, Mass., which recently placed orders for several machines, has just taken on additional equipment. The Maine Electric Co., Portland, Me., has closed for a spindle drill, horizontal boring mill and other equipment.

It is announced that the Victory plant at Squantum, Quincy, Mass., will be retained as a permanent naval base and a force of about 2500 will be employed.

A contract has been let for a new factory for the Hartford Special Machine Co., Hartford, Conn.

The Watertown Pressed Steel Co., Watertown, with a capital of $150,000, has been chartered. Arthur E. Quilty, 74 West Pine Street, Newton, Mass., is president.

The Otis Co., Palmer, Mass., has awarded a contract for the erection of a repair shop at its Three Rivers plant.

A charter has been granted the W. T. Fisher Co., Inc., to manufacture machinery, tools, etc. James Wilkinson, 625 River Street, Mattapan, Boston, is president. The company has a capital of $50,000.

The Manufacturers Foundry Co., Railroad Hill, Waterbury, Conn., has let a contract for an addition to its factory, work to begin at once.

The Bliss Rubber Co., Boston and Providence, with a capital of $5,000, has been chartered to manufacture tires, rims, automobile parts and accessories. Albert Bliss, 130 Empire Street, Providence, is president.

Albert F. Lincoln, 10 Spring Street, Taunton, Mass., has awarded a contract for the erection of a machine shop and foundry.

The Boston Mill Supply Co., Inc., has bought the buildings and land at 1046-1048 Harrison Avenue, Roxbury, Mass.

The L. and L. Automobile Accessories Corporation, Hartford, with a capital stock of $25,000, has been organized to manufacture automobile parts and accessories.

The Universal Winding Co., Auburn, R. I., has awarded contract for the erection of an addition to its foundry.

Work has been started on the new machine room of the Valley Paper Co., Holyoke, Mass.

The Winchester Repeating Arms Co., New Haven, Conn., has purchased the auger bit department of the Lebanon Machine Co., Lebanon, N. H., which will be moved to New Haven. The Lebanon Machine Co. retains its Lebanon property and will continue to operate its foundry and machine shop.

A contract for a new factory has been let by the J. H. Sessions & Sons Co., Bristol, Conn., manufacturer of trunk hardware. A large factory is being constructed for the company.

Permission has been granted by the city of New Britain, Conn., to the Fafnir Ball Bearing Co. for a new factory.

The William Schollhorn Co., New Haven, Conn., manufacturer of hardware and cutlery, is to build an addition to its factory that will give employment to 100 additional people.

Stone & Webster have been awarded a contract by the Crane Co., Chicago, manufacturer of valves and plumbing supplies, to design and construct a combined manufacturing and foundry building, 80 x 500 ft., three stories, of reinforced concrete and steel on concrete pile foundations, at their West End plant, Bridgeport, Conn. Construction has been started and is under the direction of the Stone & Webster Boston office.

The Vermont Farm Machinery Co., Bellows Falls, Vt., founded in 1868, has been taken over by the Vermont Farm Machine Corporation, a new concern with a capital stock of $1,200,000, divided equally into common and preferred stock. The officers are: Nathan G. Williams, Bellows Falls, president, general manager and treasurer; James S. Williams, Glastonbury, Conn., vice-president; J. A. Pearson, Bellows Falls, vice-president and assistant treasurer; H. J. Searles, Bellows Falls, secretary.

The General Electric Co.'s plant at Windsor, Conn., is to be doubled in size. A new building with about 40,000 sq. ft. of floor space will be erected.

Philadelphia

PHILADELPHIA, Dec. 9.

Philadelphia machinery dealers are doing a fair amount of business, though there has been no exceptionally large buying. The Newport News Shipbuilding & Dry Dock Co., with office in the Woolworth Building, New York, has issued a list of 25 to 30 miscellaneous tools for replacements. The buying will probably be done in Philadelphia. Another shipyard which has been in the market for a few tools is the Union Shipbuilding Co., Baltimore. There have been a few railroad inquiries, but no business of importance is being closed. The International Motor Co. has bought a few tools for its plant at Allentown, Pa. The Traylor Engineering & Mfg. Co., also of Allentown, has bought some equipment for the manufacture of tractors. A company at Paulsboro, N. J., will also engage in the manufacture of tractors. The Dupont Motors Corporation, Wilmington, Del., will soon buy equipment for the manufacture of passenger automobiles. The American Engineering Co., Philadelphia, and the S. S. E. Co., Philadelphia, have come into the market for tools, the latter having plans to engage in the manufacture of oil-well equipment. The Black & Decker Mfg. Co., machinery manufacturer, Baltimore, has bought a small list of new equipment. The District of Columbia school board has issued a list of tools required for a vocational school.

A. B. Landis & Sons have engaged in a jobbing machine shop business and will specialize in grinding operations. Mr. Landis was formerly connected with the machine-tool concerns at Waynesboro, Pa., which bear his name. The firm has a temporary office at 7736 Norwood Avenue, Philadelphia.

The Standard Tin Foil Corporation, Cedar and Tioga streets, Philadelphia, has awarded a contract to the Austin Co., Bulletin Building, for a two-story brick plant, 130 x 260 ft., to cost about $200,000 with equipment.

The Wicaco Screw & Machine Works, Inc., Seventh and Wood streets, Philadelphia, has acquired property, about 250 x 300 ft., at Stenton Avenue and Louden Street, from the American Metal Works, and has had plans prepared for the erection of a plant there to cost about $100,000. It will be one and two stories, of brick and concrete, 82 x 206 ft.

The Philadelphia Storage Battery Co., Ontario and C streets, Philadelphia, has filed plans for a three-story factory addition, 50 x 219 ft., to cost $40,000.

Hedler & Sherman, Inc., Philadelphia, has been incorporated with a capital stock of $30,000 by William Hayn, Jr., Whitemarsh, and associates, to manufacture electrical appliances and equipment.

The Gray Iron Foundry Co., Reading, Pa., has awarded a contract to William B. Spatz, Reading, for a one-story foundry addition to cost about $22,000. It will be 60 x 92 ft. A. L. Frame is president.

The Edward G. Budd Mfg. Co., Twenty-fifth Street and Hunting Park Avenue, Philadelphia, manufacturer of steel automobile bodies, etc., has arranged for an increase of $2,000,000 in its capital, making a total capitalization of $4,251,700. The company will build a four-story, reinforced-concrete addition, 100 x 300 ft., to cost about $500,000, including equipment.

The Philadelphia Electric Co., Tenth and Chestnut streets, Philadelphia, has completed plans for its proposed reinforced concrete power plant at Beach and Palmer streets, 130 x 197 ft., to cost about $2,500,000, including electrical machinery. Stone & Webster, Boston, Mass., will be the engineers.

The Bacon Motor Corporation, New Castle, Pa., recently incorporated with a capital of $1,500,000, has acquired a local site of 21 acres for its proposed plant for the manufacture of pleasure automobiles. F. C. Van Der Loff, Butler, Pa., formerly connected with the automobile department of the Standard Steel Car Co., Pittsburgh, and F. W. Bacon, New Castle, head the company.

The American Locomotive Co., Chester, Pa., will build a one-story power plant at its local foundries, 80 x 100 ft., on East Dunkirk Street.

The Gulden, Nute & McGehee Co., Chambersburg, Pa., has acquired the foundry and machine shop of Calvin Gilbert, Gettysburg. The machinery and equipment will be removed to Chambersburg, and installed for local operation.

The Worthington Pump & Machinery Corporation, 115

Broadway, New York, is reported to be planning for the reopening and operation of its plant at Hazleton, Pa., used during the war for the production of shells, following the relinquishment of Government control. The plant has been shut down for about a year past and at one time gave employment to about 5000 persons.

The Lebanon Steel Co., Lebanon Street, Lebanon, Pa., has had plans drawn for a one-story air compressor works, 33 x 39 ft.

The Wilmot Engineering Co., Hazleton, Pa., has inaugurated operations in its new machine shop at White Haven, comprising a large extension to its works at this location.

The Electric Co., Williamsport, Pa., has been incorporated with a capital stock of $30,000 by Allen C. Drew, Myrtle C. Drew and Eugene A. Shaffer to manufacture electrical machinery.

R. F. Sedgley, Inc., Philadelphia, capitalized at $75,000, has been incorporated to manufacture firearms, wrenches and tools. Reginald F. Sedgley, 4815 North Fifteenth Street, Philadelphia, is the principal incorporator.

Buffalo

BUFFALO, Dec. 8.

The Johnson Rim & Parts Co., 716 Ellicott Square Building, Buffalo, recently incorporated with a capitalization of $250,000, has purchased a site of 17½ acres on the Erie Railroad at Delaware Avenue and the City Athletic Field, upon which it will build a plant. Contract has been awarded to Huntley & Derdenger, Electric Building, Buffalo, for the first unit, 60 x 180 ft. The company will make steel rims for automobiles and automobile parts. Preston Large, Jr., is president; Charles E. Johnson, vice-president and general manager.

The Guilford Mfg. Co., 225 Guilford Street, Buffalo, will build a boiler room to cost $6500.

The Killington Machine Co., Syracuse, N. Y., has increased its capital stock from $10,000 to $30,000.

The machine shop addition at the Pierce plant of the American Radiator Co., Elmwood Avenue and the New York Central Railroad Belt Line, Buffalo, will be 100 x 220 ft., two stories, and cost $35,000.

The American Laundry Machine Co., Rochester, has had plans drawn for a machine shop, 161 x 198 ft., two stories.

The Sinclair Oil Refining Co., 111 West Washington Street, Chicago, is having plans prepared for an oil distributing plant to be built on the New York State Barge Canal at Syracuse at an estimated cost of $200,000.

The Muson Mill Machinery Co., Utica, N. Y., will erect a two-story factory. W. B. Foster of the Foster Brothers Mfg. Co., 807 Broad Street, is president.

The Aluminum Castings Co., Buffalo, will build an addition to its plant at Elmwood Avenue and the Erie Railroad at a cost of $30,000.

The Auto Products Mfg. Co., Buffalo, has taken out building permits for two brick factory buildings, to be erected at Elmwood and Hinman avenues at a cost of $18,000.

The Erie County Traction Corporation, Buffalo, has been incorporated with a capital stock of $450,000 by R. B. Austin, E. L. Frost and J. L. Cummings. A power house and an electric trolley line from Buffalo to East Aurora are to be built.

The General Electric Co. will build a new machine shop in connection with its Erie, Pa., works.

The Erie Motor Truck Mfg. Co., Commerce Building, Erie, Pa., recently organized, has increased its capital stock from $50,000 to $1,000,000. Plans are now under way to construct a new concrete building next spring. L. H. Heiman is president; J. J. Harvey, vice-president and general manager; J. H. Rastatter, treasurer, and H. C. Liebau, secretary.

The Dittmer Gear & Mfg. Corporation, incorporated with a capital stock of $175,000, has purchased a site at Lockport, N. Y., 252 x 264 ft., at Green and Grand streets and will construct a plant of steel, brick and concrete of 22,000 sq. ft. floor space. Plans call for a completed structure by January, when production will be started on the manufacture of transmission gears. A. H. Dittmer, for about three years director of production and purchases of the Covert Gear Co., Lockport, N. Y., is president.

The Herschell-Spillman Motor Co., North Tonawanda, N. Y., manufacturer of automobile trucks, tractors, etc., has arranged for a preferred stock issue of $750,000. T. J. Wilson is chairman of the board of directors.

The property of the Bath Machine Works, Bath, N. Y., which has been involved in bankruptcy, has been acquired by H. R. Hood and Homer Strong, Rochester, at a sale conducted by Robert C. Turnbull, trustee. The plant, with equipment, has been valued at $100,000. It has been closed for some time, and plans for a resumption of operations are under way.

The Killington Machine Co., Syracuse, N. Y., has increased its capital stock to $30,000.

The Carborundum Co., Niagara Falls, N. Y., has let contract to the Kearns Construction Co., Builders Exchange, Buffalo, for extension of its building No. 32 at Buffalo Avenue and Eighteenth Street, to cost $30,000.

The Automatic Tire Machine Corporation, Buffalo, has been incorporated with a capitalization of $1,500,000. The directors are Seward H. Millener, Ellicott Square Building, W. A. Schaffer and H. G. E. Smith.

Pittsburgh

PITTSBURGH, Dec. 8.

The local machinery market is referred to as very active in inquiries, but the amount of new business being closed is not very heavy. Machinery dealers here believe a good deal of pending business will not be closed until after Jan. 1. Makers of machine tools claim that for some months they have been doing business on a very small margin, and are now strongly inclined to get more money for machine tools, and recently prices on the standard makes of cranes went up about 5 per cent, as compared with about a month ago. Makers also state that, owing to steadily increasing costs, they will have to get still higher prices for machine tools to allow them a fair profit. The largest local inquiry in the market for cranes is the Follansbee Brothers Co., which calls for 12 or more large electric cranes for its new sheet mill plant at Toronto, Ohio; but these have not been closed. Local concerns building heavy rolling-mill and machine-works equipment report they are filled up for several months ahead, one large interest stating it has all the work on its books it can possibly get out in the next year. This particular company has taken recently several large contracts for steel-works equipment for France, but is not prepared to give out the details. No general lists of machine tools are in this market at present, but there is a very large amount of general inquiry, and dealers say this machinery will be bought sooner or later, much of it probably early in the new year.

The Follansbee Brothers Co., Pittsburgh, now building a sheet-mill plant at Toronto, Ohio, has placed an order for two 1500-hp. sheet-mill motors with the Allis-Chalmers Co., Milwaukee, through its Pittsburgh office, and has also placed an order for one 2000-hp. reversing continuous rating rolling-mill motor, together with fly-wheel motor and generator set with the Westinghouse Electric & Mfg. Co., East Pittsburgh, and the contract for the sheet-mill gear drive has been placed with the Falk Co., Milwaukee, Wis. The Follansbee Brothers Co. has inquiries out for seven large electric cranes. The Pittsburgh Knife & Forge Co., Pittsburgh, is in the market for complete crane equipment for its plant at Coraopolis, Pa. The Aluminum Co. of America, Pittsburgh, now building a new plant at Maryville, Tenn., has placed contracts for two electric cranes.

The Allegheny Gear Works, Northside, Pittsburgh, will build a one-story plant addition, 80 x 125 ft., at an estimated cost of $50,000. Some new equipment will be needed.

The Pittsburgh Rivet Co., Pittsburgh, has made a long lease for some ground adjacent to its plant, and is making plans for a new building 100 x 100 ft., for increasing the manufacture of its present products. It will be in the market for considerable new equipment for the manufacture of nuts, bolts and rivets.

The Yough Electric Co. is making plans for a new electric power plant at Connellsville, Pa., requiring new equipment.

The Crane Co., 636 South Michigan Avenue, Chicago, manufacturer of valves, steam specialties, etc., has had plans prepared for a new one-story pipe shop, 193 x 375 ft., at Twenty-fourth Street and the Allegheny Valley Railroad, Pittsburgh.

The Pittsburgh Fuse Mfg. Co., Pittsburgh, has been incorporated in Delaware with a capital stock of $100,000 by A. F. Baum, Robert H. Mollenaux and E. M. Ryan to manufacture fuses, etc.

The W. R. Case & Sons Cutlery Co., Bradford, Pa., is reported considering the erection of a plant addition.

The Star Bronze Foundry & Machine Co., 525 Aspen Street, Pittsburgh, has commenced the installation of a new machine shop to be used for the manufacture of oil-well equipment. It recently installed a new brass melting furnace for light casting work, and has provided other equipment to handle castings up to about 1000 lb. G. M. Rigby is president.

The Carnegie Co., First Street and Ellsworth Avenue,

Carnegie, Pa., has arranged for the sale of considerable machinery and equipment formerly used at the local plant of the Aetna Chemical Co. The material includes engines, pumps, drying machinery, evaporators, etc.

The Standard Machine Co., Huntington, W. Va., has been incorporated with a capital stock of $75,000 by F. M. Burgess, J. W. Thornbury and W. A. Milland to manufacture mining machinery and mill equipment.

The Sharon Iron & Metal Co., Mercer County, Pa., has changed its name to the Sharon Warren Iron & Metal Co.

The Sommerville Iron & Bronze Co., Pittsburgh, has changed its name to the Sommerville Co.

Cincinnati

CINCINNATI, Dec. 8.

Domestic orders for machine tools are coming in at a steady rate, and most plants are operating on full time. Foreign business continues slow, due to the rate of exchange and ocean shipping difficulties. The general estimate of the amount of export business for the current year will run close to 20 per cent, although some firms show an average considerably above this. Makers of portable electric drills and grinding machines are running full time, and state that business is holding up remarkably well for this season of the year. Jobbing foundries have all the work they can handle, but a few are somewhat apprehensive as to a future coke supply.

No manufacturing firms in this city or vicinity have as yet been compelled to close on account of a shortage of coal, although a number of plants are running low and unless relief is afforded soon will be compelled to suspend operations. The Oakley colony plants, supplied by a central power station there, will be able to operate on full time fully a week longer, when it is hoped some change for the better in the fuel situation may take place.

The new plant of the Trailmobile Co., Oakley, a Cincinnati suburb, is nearing completion, and installation of machinery will begin at an early date.

Work will commence soon on an addition to the plant of the Cincinnati Shaper Co., Cincinnati.

The Champion Coated Paper Co., Hamilton, Ohio, will build a machine shop addition estimated to cost $13,000.

The Middletown Artificial Ice & Coal Co., Middletown, Ohio, has increased its capital stock to $225,000, and has let contract for a 150-ton ice plant. It will also install coal handling equipment.

The Dayton-Wright Airplane Co., Dayton, Ohio, will erect an addition to its power plant on Coleman Avenue.

The addition to the plant of the Standard Register Co., Dayton, is nearing completion, and the installation of machinery will begin at an early date.

The Domestic Engineering Corporation, Dayton, will add another unit to its plant, which will enable it to increase its capacity nearly 50 per cent.

The Springfield Light, Heat & Power Co., Springfield, Ohio, is preparing to add equipment which will double its present capacity.

The Thompson Grinder Co., Springfield, will build an addition to its plant at an early date.

The new plant of the Henderson Tire & Rubber Co., Columbus, Ohio, has been completed and operations will begin before the end of the month.

The John Immel & Sons Co., Columbus, Ohio, maker of automobile bodies, has let contract for a manufacturing building, 250 x 350 ft. A power plant will also be erected.

The Pennsylvania Railroad Co. has secured permits for three additions to its shops at Columbus, Ohio.

The American Road Machinery Co., Delphos, Ohio, has commenced work on two additions to its plant.

Cleveland

CLEVELAND, Dec. 8.

The demand for machinery continues heavy, with little evidence of the usual let-up in December. The Goodyear Tire & Rubber Co., Akron, Ohio, is in the market for equipment for its large rim plant and machine shop. Its complete needs are not known, as lists have not been sent out, but the requirements include 19 boring mills. Automobile manufacturers are still buying considerable equipment in small lots and the demand for turret lathes from this source is quite active. A large volume of business in presses, mostly for automobile bodies and frames, is being placed in this district, the Cleveland office of the E. W. Bliss Co. alone taking five orders for over 50 presses, aggregating more than $500,000, in the past 10 days. Among companies buying equipment for extensions is the Mullins Body Corporation, Salem, Ohio.

A number of price advances were made the past week. Press manufacturers have marked up prices 10 per cent and similar advances have been made by some manufacturers of boring mills, planers, universal grinding machines and engine and precision lathes. There has been some advance on one line of heavy duty drilling machines.

The Franz Foundry & Machine Co., Akron, Ohio, has been incorporated with a capital stock of $400,000 by C. Franz and others to manufacture rubber-making machinery. It has purchased a plant in Barberton, Ohio, and contemplates making extensions. The officers are: C. Franz, president; C. W. Franz, vice-president; J. A. Brittain, secretary, and Ward H. Parry, treasurer. C. Franz was secretary of the J. K. Williams Co., Akron, for many years.

The Riddle Mfg. Co., Ravenna, Ohio, will be incorporated with a capital stock of $1,000,000 to succeed the Riddle Coach & Hearse Co. It will erect a new plant for the manufacture of funeral cars and other lines of motor vehicles. C. G. Bentley will be president, H. W. Riddle vice-president, and George H. Robison, secretary of the old company, will be secretary, treasurer and general manager.

The Cuyahoga Falls plant of the Atlantic Foundry Co., Akron, Ohio, recently burned, will be rebuilt at once.

The Peerless Drawn Steel Co., Massillon, Ohio, will erect a one-story addition, 100 x 200 ft., at an estimated cost of $150,000.

The Refrigerator Engineering Co., Toledo, Ohio, has acquired a 7½-acre site on Dorr Street, near the plant of the Toledo Bridge & Crane Co., on which it will erect a factory for the manufacture of refrigerating plants. The company is now located in the Toledo Factories Building.

The Buckeye Traction Ditcher Co., Findlay, Ohio, will build a new foundry, 200 x 100 ft., for the manufacture of gray iron and steel castings.

The Acme Specialty Co., Toledo, will erect a three-story factory, 45 x 100 ft.

The Rummell Mfg. Co., Findlay, Ohio, has been incorporated with a capital stock of $75,000 by W. R. Rummell & Co., to manufacture spark plugs.

The Bucyrus Machine & Tool Co., Bucyrus, Ohio, has commenced the erection of an addition, 36 x 120 ft., to be used as a machine shop and offices.

The Dangler Stove Co., Cleveland, plans a one-story addition, 50 x 200 ft.

The Findlay Engineering Co., Findlay, Ohio, has purchased the property of the Findlay Iron & Coal Co. It is announced that the new owners will erect a foundry.

The Barnes Mfg. Co., Mansfield, Ohio, is erecting a two-story machine shop addition, 22 x 126 ft.

Indianapolis

INDIANAPOLIS, Dec. 8.

The G. & J. Tire Co., Indianapolis, has bought about a block of land adjoining its property for extensions, and work has been started on a five-story building, 110 x 400 ft. A new power house is nearing completion. W. B. Harding is president. The United States Rubber Co. is the parent organization.

The Marine Tire & Rubber Co. of Indiana has been incorporated at Winchester, Ind., with $200,000 capital stock to manufacture automobile tires. The directors are William J. Hubert, Will H. Brenner and George F. Mercier.

The Logansport Body Works, Logansport, Ind., has been organized with $200,000 capital stock to manufacture automobile bodies. The directors are Edwin Ash, Sol O. Cook and William O. Murdock.

The Sheet Steel Products Co., manufacturer of pressed steel parts for automobiles, will move its plant from Bryan, Ohio, to Michigan City, Ind.

The Pittsburgh Plate Glass Co., is having plans prepared for a new power plant.

The Lever Coil Spring Co., East Chicago, Ind., has been incorporated with $200,000 capital stock. The directors are Charles S. Rhoades, Richard T. Hamilton and Clarence C. Smith.

The newly organized Muncie Foundry Co., Muncie, Ind., has bought the plant of the Whiteley Malleable Castings Co. of that city. Governor Sleeper of Michigan; J. N. Klock, manager of a Benton Harbor, Mich., foundry, and J. Lloyd Kimbrough, vice-president, Indiana Bridge Co., Muncie, are interested in the new organization. The Whiteley Steel Co. was not included in the sale.

The Schacht Foundry Co. will move from Elkhart, Ind., to Goshen, Ind.

The Standard Motor Parts Co., Lebanon, Ind., preparatory to establishing itself in a factory, has bought the machinery and patent rights of the Thor Motorcycle Co. of that city.

In view of the establishment of a branch plant for the General Electric Co. at Decatur, Ind., the Common Council has engaged D. McNaughton, New York, to prepare plans for another power plant for the city.

The Commercial Engineering Co., Inc., Indianapolis, has increased its capital stock from $50,000 to $100,000.

The Spira Spark Plug Co., Anderson, Ind., has increased its capital stock from $2,000 to $50,000.

Chicago

CHICAGO, Dec. 8.

The increasing gravity of the coal situation is being felt in the machine tool industry. A number of tool manufacturers have curtailed production and two plants in the Central West have suspended operations entirely. Another week of coal shortage will probably find other makers closing. Deliveries, of course, are steadily getting worse, but as yet there seems to be no decline in the aggregate demand. The International Harvester Co. has purchased seven turret lathes and Fairbanks, Morse & Co. have ordered two for their Beloit plant. The Simmons Co., bedstead manufacturer, Kenosha, Wis., which has been buying heavily of late, has bought 16 additional power presses The E. H. Wachs Co., manufacturer of engines, 1525 Dayton Street, Chicago, has awarded a contract for a $32,000 addition, for which it has purchased $15,000 worth of machine tool equipment. One local dealer recently booked orders for four 5-ft. radial drills, three of which went to one customer and one to another.

The Climax Engineering Co., manufacturer of tractor engines, Clinton, Iowa, is inquiring for the following equipment:

One 10-in. x 36-in. universal grinding machine.
One 18-in. x 60-in. crank pin grinding machine.
One universal boring machine with 3 or 3½-in. bar.
One 16-in. x 8-ft. tool room lathe.
One No. 5 vertical spindle milling machine.
One No. 5 or 6 Lincoln type milling machine.
One vertical spindle disk grinding machine, 53 in. x 60 in.
One 20 to 24-in. crank type shaper.
One tapping machine.
One 12-in. floor type, foot feed, high speed sensitive drill.
One 30-in. radial drill with tapping attachment.
One 48-in. x 48-in. x 12 to 20-ft. second hand heavy type planer.
One 36-in. radial sensitive drill.

The General Electric Co. has sent out an inquiry for a small lot of equipment for delivery at Fort Wayne, Ind. Eugene Y. Sayer, 1328 Broadway, New York, is in the market for about 25 miscellaneous tools for export to Mexico. Both consumers and dealers are buying some Government tools located at the Chicago storage depot, but purchases have not been heavy on account of the high prices asked. Some of the machinery in the local depot was included in the $3 000,000 purchase by the Belgians and a portion of it is being distributed among Government arsenals and post-offices.

Permits were issued in Chicago in November for 765 buildings, fronting 26,363 ft. and involving a total estimated cost of $17,577,000, as compared with 76 buildings, 3411 ft. frontage and $1,223,400 for the corresponding month a year ago. This is by far the best record for November for the past ten years.

Alfred S. Alschuler, architect, 26 East Jackson Boulevard, Chicago, is receiving bids on a one-story factory and foundry, 135 x 356 ft., to be built at 4300 to 4326 West Lake Street for the Sloan Valve Co., 617 West Jackson Boulevard. It will be of brick, steel and concrete and will cost $70,000.

The Chicago Curtain Stretcher Co., 3725 South Wall Street, Chicago, has awarded a contract for the construction of a three-story factory, 48 x 93 ft., at 3715-17 Wall Street, to cost $30,000.

The Krasberg Engineering & Mfg. Co., manufacturer of machinery and tools, 536 Lake Shore Drive, Chicago, has awarded a contract for the construction of a one-story addition, 37 x 56 ft., at 451 East Ohio Street, to cost $4,000.

The Continental Can Co., 213 Institute Place, Chicago, is erecting a plant for its closing machine department at Thirty-ninth Street and Ashland Avenue.

The Mason City Foundry & Machine Co., Mason City, Iowa, was recently incorporated with $30,000 capital stock by R. E. Wilcox, L. G. Dreyer and others.

The E. J. List Mfg. Co., manufacturer of clutches, etc., Havana, Ill., recently incorporated with $35,000 capital stock, is erecting an addition to its plant and is in the market for machine tool equipment.

Moore Brothers Co., Benton Street, Joliet, Ill., manufacturer of metal products, has broken ground for a one-story foundry, 60 x 70 ft., to cost about $20,000.

The Cadillac Motor Car Co., 2300-08 Indiana Avenue, Chicago, has filed plans for the erection of a six-story, brick and concrete shop to cost about $400,000.

The Buda Motor Co., Harvey, Ill., manufacturer of automobile motors, has completed plans for the erection of a two-story addition, 40 x 160 ft., to cost about $75,000.

The South Bend Motors Co., Chicago, has increased its capital stock from $1,500,000 to $6,000,000.

The Litterer Brothers Mfg. Co., 154-56 Whiting Street, Chicago, manufacturer of metal products, is taking bids for the erection of a new one-story plant at Rockwell and Wasaw streets, 92 x 164 ft., to cost $45,000.

The Richards Wilcox Mfg. Co., Aurora, Ill., manufacturer of metal door hangers and other hardware, is having plans drawn for a two-story addition on Lake Street, to cost about $125,000.

The Pullman Co., 105th Street and Lake Calumet Avenue, Chicago, has filed plans for the erection of a brick addition to its car shops to cost $50,000.

Detroit

DETROIT, Dec. 8.

The H. R. Lewis Tool & Supply Co., Detroit, has been purchased by F. R. Fortune, Wooster, Ohio, and moved to that city, where a new corporation under the name of the F. R. Fortune Tool & Mfg. Co. has been organized with a capital stock of $200,000. R. K. Evans, former works manager of the Lewis company, will continue in a similar capacity with the Fortune company.

An accumulated surplus of $1,100,000 of the Edmunds & Jones Corporation, Detroit, will be used for expansion. The company manufactures automobile lamps.

The Moak Machine & Tool Co., Port Huron, Mich., announces the opening of its new gray iron casting foundry.

The American Auto Parts Co., Detroit, has been organized with the following officers to build a large automobile spring plant: W. E. Perrine, formerly assistant general manager of the Standard Parts Co.; F. F. Grimmelsman, vice-president and general manager; J. W. Stannard, secretary and treasurer, and W. P. Culver, sales manager. The works will be equipped with the most modern mechanical devices and heat treating furnaces utilized in the automobile spring industry and will have an immediate capacity of 2500 tons of steel per month. The furnaces and other heat-treating equipment have been designed and constructed by the McCann-Harrison Co., Cleveland, consulting engineer, which also designed the power and heating system, and will supervise their installation. The building is being erected by the Thompson-Starrett Co.

The Hackett Motor Car Co., which operates a motor truck manufacturing plant at Burlingame, just west of Grand Rapids, Mich., has reorganized under the name of the Lorraine Motors Corporation, and plans to increase its production from two to 10 trucks a day. Additional units will be erected.

The Atlas Drop Forge Co., Lansing, Mich., has awarded contracts to the Wisconsin Bridge & Iron Co., Milwaukee, for extensions and improvements. Work will begin at once. Plans call for an extension of 150 ft. to the steel storage house. Three heavy hammers and three heavy presses will be added to the equipment, and the furnace capacity will be increased. It is proposed to add a boiler of more than 300 hp., which will necessitate additions to the power plant. A second traveling crane will be installed.

To carry out its extensive building program for next year, the Nelson Motor Truck Co., Saginaw, Mich., has started work on an addition 70 x 130 ft. to its present plant. It intends to increase its production to 15,000 trucks annually by the end of 1921.

The Jackson Metal Products Co., Jackson, Mich., has awarded contracts for the erection of brick, steel and concrete buildings to cost approximately $50,000 and to cover about 16,000 sq. ft. of floor space.

The Transportation Truck Co., Detroit, recently organized, will locate its plant at Monroe, Mich.

The American Road Machinery Co. is preparing to build a plant in Bay City, Mich., for the manufacture of its products. The first building will be 50 x 200 ft., one-story. A foundry will be constructed in the spring.

The Advance-Rumely Co., Battle Creek, Mich., is adding about 500 men to its force. Last week 50 new men were taken on in the foundry, boiler and machine departments.

The Manistee Drop Forge Co., Manistee, Mich., has completed the first section of its addition.

The Alamo Farm Light Co., Hillsdale, Mich., manufacturer of unit lighting plants for farm use, etc., has broken ground for the erection of an addition to increase the capacity from 25 to 100 lighting units per day. The structure will be equipped to give employment to about 200 persons, and is estimated to cost $200,000.

The Gray Motor Co., Mack Avenue, Detroit, is taking bids for the erection of a one-story addition, 80 x 160 ft. W. A. Blackburn is superintendent.

The Timken-Detroit Axle Co., Detroit, has increased its capital from $6,000,000 to $48,000,000.

The Mutual Electric & Machine Co., 232 West Fort Street, Detroit, will extend and remodel its three-story plant at a cost of about $12,000.

The General Motors Corporation, 88 Congress Street, Detroit, has broken ground for the erection of a one-story addition to its axle plant at Holbrook and St. Aubin streets, 300 x 900 ft.

The Monarch Foundry Co., 907 Greenwood Avenue, Detroit, Mich., manufacturer of automobile crank casings, castings, etc., has had plans prepared for a one-story foundry, core and power house addition, 100 x 200 ft., to cost $100,000.

Milwaukee

MILWAUKEE, Dec. 8.

A serious situation regarding production and delivery of machine tools has been created by the fuel supply. Beginning today, and until further notice, all manufacturers in Milwaukee County have been ordered to restrict operations to six hours a day, six days a week. Since most shops, especially makers of milling machines, are well sold up until March 1, and even later, and new business is being booked at a steadily increasing rate, the reduction of operating schedules is a distinctly unfavorable factor.

The General Motors Corporation, New York, through the Samson Tractor Co., Janesville, Wis., will build a one-story foundry extension, 120 x 180 ft., to the former shops of the Janesville Machine Co., merged with the Samson company. The old shops will be converted for the production of passenger cars and farm trucks, the general operations of the Janesville Machine Co. as a manufacturer of farm implements and power farm machinery having been transferred to the new group of the Samson company in Janesville.

The Madison-Kipp Co., Madison, Wis., manufacturer of automatic lubricating devices for machinery, engines, etc., has plans for a five-story brick and concrete machine shop and factory addition, 52 x 240 ft., the first two stories to be built immediately. The building is estimated to cost $200,000 without equipment. Ground was broken Dec. 1.

The Bankers Automatic Alarm Corporation, Milwaukee, has been incorporated with an authorized capital stock of $500,000 to manufacture automatic burglar alarm systems. The incorporators are F. J. Jennings, L. B. Miller and J. A. Baer.

The Langstadt-Meyer Co., Appleton, Wis., will expend $75,000 for shop extensions and equipment for the production of self-contained electric generating units in two sizes, 1½ and 5-kw. Orders have been received from the Government for the aviation section of the Signal Corps, and considerable domestic and export business has been booked.

The Duplex Storage Battery Co. of Milwaukee, a new $50,000 corporation, has leased a factory and is purchasing equipment for manufacturing accumulators. Operations are expected to begin Jan. 1. William Petschold is president and general manager.

The Manufacturers Foundry Co., Milwaukee, contemplates the erection of extensions the coming year, but definite plans have not been made. The plant is located at Fifteenth and Oklahoma avenues.

The Longdin-Brugger Co., Fond du Lac, Wis., manufacturer of body attachments for passenger automobiles, has acquired a site for a new factory, 120 x 240 ft., and is increasing its capital stock from $40,000 to $120,000 to finance the project. Carl H. Brugger is general manager.

The Globe Foundry Co., Sheboygan, Wis., has awarded contracts for the erection of a new gray iron foundry, 100 x 128 ft., core building, pattern shop, etc., 70 x 150 ft., estimated to cost $100,000 with equipment. G. F. Honold is president.

The Sterling Tool & Mfg. Co., Milwaukee, has been incorporated with a capital stock of $25,000 to manufacture machinery, tools, etc. The incorporators are E. G. Patek, Harry R. Kuntz and Louis Wiener.

John Lundquist, Mellen, Wis., has opened a general machine shop and repair works.

The Roe Metal Sandal Co. of Milwaukee, recently incorporated with a capital stock of $500,000, will manufacture a steel and aluminum sandal attachment for workmen's shoes. For the present the article will be manufactured under contract. C. O. Roe, Mayer Building, is general manager.

The Remmel Mfg. Co., Kewaskum, Wis., the incorporation of the foundry and machine shop business of Nicholas Remmel, is building a one-story foundry addition, 40 x 80 ft., and a one-story machine shop extension, 35 x 120 ft.

The Cleveland Welding & Mfg. Co., Cleveland, Manitowoc County, Wis., has plans for a one-story brick and concrete machine shop, 60 x 120 ft., and will soon be in the market for additional equipment.

The A. O. Smith Corporation, Milwaukee, has awarded contracts for the second unit of its enlargement project which will provide 400,000 sq. ft. additional manufacturing space by July 1. The second unit consists of a brick and steel shop, 360 x 850 ft., two stories, with a section six stories. The company is inquiring for a large amount of miscellaneous equipment. W. E. Seymour is vice-president and general manager.

The Wisconsin Parts Mfg. Co., Oshkosh, Wis., manufacturer of rear axles and other automotive parts, has broken ground for a one-story brick and steel shop addition, 30 x 240 ft. Additional machine tool equipment will be purchased.

The Malleable Iron Range Co., Beaver Dam, Wis., has awarded contracts for a three-story brick and mill addition, 70 x 145 ft. Lockwood, Greene & Co., Chicago, are the consulting engineers.

The Antigo Tractor Co., Antigo, Wis., a new $500,000 corporation, has contracted with the Murray-Mylrea Machine Co., of the same city, for the production of its machines until its new plant is ready for occupancy about April 1.

The Walker Mfg. Co., Racine, Wis., is building a one-story brick and steel foundry, 120 x 120 ft. It manufactures automobile jacks and other automotive equipment. The consulting engineers are Klug & Smith, Mack Block, Milwaukee.

St. Louis

ST. LOUIS, Dec. 8.

The Beck & Corbitt Iron Co., First and Ashley streets, St. Louis, expects to be in the market in a short time for two 15-ton 75-ft. span electric cranes, one 10-ton electric crane with magnet, one 84-in. shear for ¾-in plate, 48-in. sheet shear for 8 or 10 gage, a bar and angle shear for 6-in. angles and 6 x 1-in. bars, one cold saw with table for use in cutting structural shapes, all equipment to be motor-driven. William L. Niekamp is president and general manager.

The Harrisburg Light & Power Co., Harrisburg, Ark., will erect three brick buildings and install $20,000 worth of ice machinery, $30,000 worth of light and waterworks machinery and $20,000 worth of cotton gin equipment.

The Oklahoma Gas & Electric Co., Oklahoma City, Okla., will equip a station in Western Oklahoma with an initial capacity of 10,000 hp. H. M. Byllesby & Co., Chicago, Ill., are the engineers.

The Hussman Refrigerator & Butcher Supply Co., 913 North Broadway, St. Louis, will erect a two-story building, 130 x 260 ft. for the manufacture of refrigerators and refrigerating machinery.

The R. P. Hyams Coal Co., New Orleans, La., will erect a 60-ton ice making plant.

The Jackson Ice Co., Jackson, Miss., will install ice-making equipment of 20 tons daily capacity.

The National Lamp Works, St. Louis, will erect a plant at a cost of $250,000 for the manufacture of electric light bulbs, etc.

The Gulf States Tractor Co., New Orleans, La., H. Hagedorn, manager, will erect a plant at a cost of $375,000 to manufacture farm tractors, etc.

The Beard-Qualia Co., Carthage, Mo., Harley C. Beard, secretary, is in the market for automatic machinery for the manufacture of cement bricks.

Baltimore

BALTIMORE, Dec. 8.

Fire, Dec. 3, badly damaged a large part of the Canton Lumber Co., Baltimore, including a machine shop, two floating stages at the yards of the Spedden Shipbuilding Co., four welding barges owned by the Davidson Welding Co., the Siemon Wenzel Electric Welding Co., the Maryland Electric Welding Co., and the United Electric Welding Co., and a number of boats. The damage is estimated at $750,000.

The Standard Wholesale Phosphate Co., Continental Building, Baltimore, will build a factory building at Curtis Bay, Md., to cost $60,000.

Samuel T. Williams, 223 North Calvert Street, Baltimore, is interested in quotations on acetylene welding and cutting torches.

The Crown Cork & Seal Co., 1511 Guilford Avenue, Baltimore, will build large additions to its machine shop in the early spring. The announcement was made by John M. Hood, Jr., president, who also announced that negotiations have been consummated for the acquisition of additional property in Yokohama in order to provide for the extension of its plant in that city.

The Eastern Shore Can Co., Hurlock, Md., has been incorporated with $500,000 capital stock to manufacture hermetically sealed cans, etc. The incorporators are Walter M. Wright, S. Elbert Douglas and Fred P. Owens.

Prices on gear cutters, bolt machines, electric drills and chain hoists are wanted by the Guyan Machine Works Logan, W. Va.

The Wizard Automobile Co., Charlotte, N. C., has been incorporated with $1,000,000 capital stock, and plans to establish a factory. R. L. Walters is manager.

The Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., will build a power-house to cost about $9,000.

The Beggs Foundry Co., Bessemer, Ala., has been incorporated with $3,000 capital stock by J. P. Beggs and others.

The Kilby Frog & Switch Co., Birmingham, Ala., plans to build a plant addition to cost $30,000.

The Montgomery Coal Washing & Mfg. Co., Birmingham, Ala., manufacturer of coal-washing machinery, castings, etc., is understood to be planning to increase its output.

The Howell Motor Co., Mount Royal Avenue and Cathedral Street, Baltimore, is having plans prepared for a two-story service and repair works, 100 x 127 ft., to cost $45,000.

Robert A. Rupp, Hagerstown, Md., is arranging for the establishment of a local plant for the manufacture of a steel stitching device for use in leather working. William M. Conover, Gettysburg, Pa., is interested in the enterprise.

The Chain & Sprocket Service Co., Wilmington, Del., has been incorporated with a capital stock of $110,000 by E. W. Penter, R. H. Sadler and L. B. Davenport.

The Oldsmar Tractor Co., Oldsmar, Fla., has had plans and specifications prepared for an addition to triple its output. It is proposed to develop a capacity of about 25 tractors per day. H. J. Keller is general manager.

The Wizard Automobile Co., Charlotte, N. C., recently incorporated with a capital stock of $1,000,000 to manufacture automobiles, has had plans prepared for a four-story reinforced-concrete plant, 200 x 600 ft. It is planned to develop a daily capacity of 75 roadsters, and the initial machinery installation is estimated to cost $200,000. F. W. Edwardy is president and secretary, and T. A. MacEwan is mechanical engineer.

Texas

AUSTIN, Dec. 8.

Elliott Jones & Co., Inc., of San Antonio, has purchased 94 acres adjacent to the city, upon which it will build a 4000-bbl. refinery to cost about $350,000. Elliott Jones is president.

The Needville Gin & Light Co., Needville, has been incorporated with a capital of $45,000 to build a cotton gin and electric light plant. C. A. Weathered is a stockholder.

The Crescent Sheet Metal Co., Ranger, which has a capital stock of $10,000 will establish a metal-working plant. F. E. Skinner, Ranger, is a stockholder.

The Fort Worth Drilling Tool Co., Fort Worth, Tex., recently incorporated with a capital stock of $400,000 to manufacture oil well equipment, tools, etc., has awarded contract to the Austin Co., Cleveland, for the erection of its proposed plant on an 8-acre site. The initial buildings will consist of a one-story machine shop, 90 x 120 ft.; one-story forge shop, 50 x 122 ft.; general manufacturing building, office, etc.

The Texas Implement Mfg. Co., McGregor, Tex., has been incorporated with a capital of $200,000 by M. A. Jones, J. F. Cavitt and G. H. Caulfield, to manufacture tools and implements.

Sutton, Steele & Sutton, Inc., Dallas, Tex., manufacturer of oil well and mining machinery, will build an addition to its plant to cost about $200,000, including equipment. The structures will include a one-story steel and concrete building, 40 x 100 ft.; one-story building, 50 x 80 ft.; testing and demonstration works and other structures.

Loffin Brothers, Westville, Ohio, have had plans prepared for the erection of a new foundry and machine shop for tool and machinery manufacture at Eastland, Tex.

The Dublin Oil & Refining Co., Dublin, Tex., recently organized, is having plans prepared for the erection of a refinery, with initial capacity of 4000 bbl. per day. R. J. Lyles, 501 Independent Life Building, Nashville, Tenn., is president, and F. R. McGee, Dublin, manager.

The Wyatt Metal & Boiler Works, Dallas, has been awarded contract by the Fullman Oil & Refining Co. for the construction of a 3000-bbl. refinery at Dublin. A pipe line will be laid from Desdemona to Dublin.

The Lucey Mfg. Co., Houston, will begin the construction of a new plant for the manufacture of oil well supplies as soon as a site can be purchased. The proposed plant will cost $1,000,000 and will consist of a forge shop and eight units. The foundries will be equipped with open-hearth and electric furnaces. J. F. Lucey is president.

The Texas Ice & Cold Storage Co. will build a cold storage plant at Dallas to cost about $200,000.

The Grant Machine & Tool Co., Desdemona, has been incorporated with a capital of $24,000 and will build a machine shop. S. D. Shirk, Desdemona, is a stockholder.

Plans have been adopted by the American Public Service Corporation, Dallas, for a new electric light, power and ice plant to be constructed at Abilene at a cost of $700,000. The project also includes the construction of power transmission lines from the new central station to Anson, Merkel, Stamford, Hamilton and Cisco. The proposed ice plant will have a daily capacity of 200 tons. A. Hardgrave is vice-president.

The Four States Oil & Refining Co., Quanah, has let contract to the Haynes Construction Co. for the construction of a refinery with a daily capacity of 2500 bbls.

The Marland Refining Co., Ponca City, Okla., has purchased 1800 acres on the Ship Channel at Houston which it will use as a site for a refinery to cost about $2,500,000.

The contract for the construction of 225 miles of pipe line, pumping stations and tankage in Texas has been awarded to the J. G. White Engineering Corporation, 43 Exchange Place, New York, by the White Oil Corporation. E. G. Williams, vice-president J. G. White Engineering Corporation, and members of its staff have left for Texas to begin the work. Forces and plant are being assembled and large commitments have already been made for the material and machinery. The line will afford an additional 20,000-bbl. daily outlet from the Ranger fields and vicinity.

The Pacific Coast

SEATTLE, Dec. 2.

The Spokane Steam Tractor Co., Spokane, has been incorporated with $150,000 capital stock to manufacture steam engines used as motor power for farm equipment. The incorporators are R. D. Fish, I. M. Comer and L. C. Jesseph.

E. K. Bishop, Bishop Lumber Mill, Montesano, Wash., will construct a new mill with a daily capacity of 60,000 ft. It will be electrically operated.

Preliminary work has begun on the proposed plant of the Dallas Machine & Locomotive Works, Dallas, Ore., to cost about $35,000. Carl Gerlinger heads the company.

The Currey Ball Bearing Springs Co., Portland, Ore., has been organized with $25,000 capital stock by G. E. Robinson, G. O. McCroskey et al., and will establish a plant for the manufacture of engines and ball bearing springs.

The Eclipse Mill Co., Everett, Wash., will make improvements at its plant to cost $25,000. A two-story building will be constructed, equipped with electrically driven machinery.

The Specialty Foundry Co., Portland, will construct another building, 100 x 100 ft., two stories. New equipment will be installed.

The Ulmer Machine Co., Porterville, Cal., has contracted for a new machine shop, 110 x 180 ft.

The Armistead Ashley Engineering Corporation, Reno, Nev., manufacturer of tractors, pumps and other machinery, proposes to install a machine shop in California.

Goetz & Kirk have taken a lease on the Colusa Machine Shop, Colusa, Cal.

The United Engineering Co., San Francisco, has bought for approximately $125,000 property at the corner of Stewart and Folsom streets, where it will manufacture the Franco Tosi full Diesel marine engine. The building is 150 x 150 ft. and is being remodeled. It is planned to start operations about January 1.

The California Tool Works, San Francisco, specializing in the manufacture of the Diamond turn and stop signal, is planning to enlarge its factory by taking over the second floor of the building it now occupies.

The Goodyear Tire & Rubber Co., Ascot Park, Los Angeles, has filed plans for the erection of a one-story machine shop, 48 x 144 ft., at its proposed new plant.

The Peerless Metal Bearing Co., 506 East Ninth Street, Los Angeles, has been organized to manufacture metal products. William H. Hartley, 3002 Moss Avenue, and William Young, 2110 Estrella Avenue, head the company.

The Ventura Mfg. & Implement Co., Thompson Boulevard, Ventura, Cal., is planning for the erection of several new buildings for increased output.

N. J. Blanchard, Seattle, will establish a construction and repair yard on Lake Union, consisting of a boat shop, 40x120 feet, wood-working shop, small marine railroad and a 150-ton drydock.

The Portland Cement Pipe Co., Portland, will erect a plant in Bend, Ore., for the manufacture of cement pipe.

The Consolidated Truck Co., Los Angeles, has been incorporated with a capital of $99,000 by R. Frazer, 5840 South Los Angeles Street; C. J. Gaudaur, 1717 Plata Street, and R. C. Neisler, 1219 Stanford Avenue, to manufacture motor trucks.

The Davino Aerial Apparatus Co., Los Angeles, has been incorporated with a capital stock of $200,000 by R. B. H. Morrill, Alphonsus Davino and A. J. Lewis, to manufacture aircraft, parts, etc.

Crowley Brothers, Spokane, Wash., will erect an electrically-operated sash and door factory to cost $50,000.

The G. M. Standifer Construction Co., Portland, has received contracts for five 9500-ton steel vessels, said to be for the Green Star Steamship Co. of New York.

The Crystal Ice & Storage Co., Portland, will erect a three-story plant, the main structure to be 115 x 110 ft. It will cost complete $125,000.

Canada

TORONTO, Dec. 8.

The demand for machine tools continues brisk. Shipments on some lines are coming through a little better, but in most cases dealers are unable to promise delivery in less than four or five months. The Canadian National Railways continue heavy buyers and last week placed orders with local dealers for a number of carbon drills and additional orders are still looked for. Buying is becoming more general, although there is a change that the coal shortage will affect some plants and firms are reluctant to add to their equipment, with a prospect of a shutdown.

The Canadian Ingersoll-Rand Co., Sherbrooke, Que., is asking quotations on one 10 x 20-ft. planer; one 16 x 24-ft. vertical extension boring mill; one 7-ft. radial drill and one floor type boring mill with 6-in. spindle. The Fraser, Brace Shipyards, Ltd., 83 Craig Street West, Montreal, is in the market for one oil-heated angle iron furnace; one plate bending roll; two vertical punching machines; six plate punching tables; two single-head shears; one horizontal punching machine; three radial countersinking machines; one angle iron cutting machine and an emery wheel. The McKinnon Industries, Ltd., St. Catharines, Ont., is in the market for seven engine lathes, 14-in.; three drill presses, 20 to 26 in., new or second hand. Edward Neville, 130 Ontario Street, Toronto, is in the market for a set of 48-in. sheet metal rolls. R. C. Desrochers, Ottawa, Ont., is calling for bids on grain conveyor equipment for the Dominion Department of Public Works for installation at St. John, N. B. The Hanover Portland Cement, Hanover, Ont., will shortly be in the market for quarry machinery. The Engineering Service, Ltd., 233 St. James Street, Montreal, is in the market for contractors' equipment, machinery, etc. Mr. Fulford, Metallic Roofing Co., King and Dufferin streets, Toronto, is in the market for a small upright blue printing machine. The Beaver Knitting Mills, Ltd., Alton, Ont., is in the market for one 5- and one 3-hp. motor, 60-cycle, 220-volt, single phase.

J. M. Robertson, Ltd., Montreal, has plans for a lumber mill at Braeside, Ont., for Gillies Brothers, to replace the one recently destroyed by fire. There will be four buildings in the group, including a power house equipped with a steam turbine for generating electricity to drive the machinery.

The Robbins & Myers Co. of Canada, Ltd., Brantford, Ont., has been incorporated with a capital stock of $2,000,000 by Willoughby S. Brewster, George D. Heyd, Roy Booth and others to take over the business of the Robbins & Myers Co., Springfield, Ohio, in so far as it relates to the Dominion of Canada. It will manufacture electric motors, machinery, tools, appliances, etc. Work has started on the erection of a plant at Brantford.

The Reliance Fuse Co. of Canada, Ltd., Bridgeburg, Ont., has been incorporated with a capital stock of $500,000 by Howard H. Baker, Horace S. Southall, both of Buffalo, N. Y.; James Moore, Brooklin, Ont.; William C. Southcott, London, Ont., and others to manufacture machinery, electrical equipment, etc.

Work is under way on the extension to the bolt and nut building of the Steel Co. of Canada, Montreal, which will provide about 60,000 ft. extra floor space. It will be used partly for storage and shipping and to enlarge its manufacturing facilities. The building will be four stories, of reinforced concrete, and will cost upward of $150,000. F. G. Peden, Montreal, is architect, and the Anglin-Norcross Co. is the general contractors.

The Great Lakes Paper Co. will start work at an early date on the erection of pulp and paper mills at Port Arthur, Ont., to cost $6,000,000. Lewis L. Alsted, Combined Locks, Wis., is president, and Hardy Ferguson, New York, engineer.

The Canadian General Fire Extinguisher Co., 2440 Dundas Street West, Toronto, will erect a plant to cost $500,000. Mr. Horne is general manager.

The Canadian National Carbon Co., 265 Adelaide Street West, Toronto, Ont., has secured a site in the city and will erect a plant. Work will be started soon.

The Bancroft Lumber & Mfg. Co. will build a sawmill at Poudash Lake, Ont., to cost $50,000. Construction will be started at once. E. S. Hubbel, Bancroft, Ont., is manager.

The Holmes Foundry Co., Sarnia, Ont., will build an addition to its plant.

The Canadian Symphonola Co., 31 Brock Avenue, Toronto, is having plans prepared by H. G. Paull, 395 College Street, for the erection of an addition to its plant to cost about $80,000. William Long is president.

The Lincoln Construction Co., St. Catharines, Ont., has the general contract for the construction of forge shop for the McKinnon Industries, Ltd., to cost $18,000.

The Beaver Board Co., Thorold, Ont., will build a new factory to cost $75,000. The Carswell Construction Co., 58 Wellington Street East, Toronto, has the general contract.

The Rumeley Mfg. Co., Winnipeg, Man., will make repairs to its plant to cost $40,000.

The Dominion Steel Products Co., Merrell and Holmes streets, Brantford, Ont., is having plans prepared for the erection of a plant. W. P. Kellett is manager.

The Alberta Flour Mills, Calgary, Alta., is making arrangements for the erection of new mills to cost $5,000,000.

The Perfect Machine Co., Galt, Ont., will start work at once on an addition to its plant to cost about $50,000.

The National Steel Car Corporation, Ltd., Toronto, has been incorporated with a capital stock of $500,000 by James S. Lovell, 25 King Street, West; George G. Paulin, 76 Grosvenor Street; William Bain and others. It will take over the business and plant of the National Steel Car Co., Ltd., and will manufacture cars, railroad equipment, machinery, etc.

The Emerson Canadian Co., Ltd., Toronto, has been incorporated with a capital stock of $500,000 by James W. Bicknell, 6 Adelaide Street, East; Arthur L. Clements, William A. Marshall, 443 Gladstone Avenue, and others, to manufacture phonographic machines, accessories, tools, etc.

Cluff Brothers, Toronto, are equipping their plant on Atlantic Avenue to manufacture tractors. The interests of the Chase Motor Co., Syracuse, N. Y., were recently purchased by the Cluff organization, and the headquarters have been moved to Toronto.

The Reliance Mfg. Co., Bridgeburg, Ont., will establish a plant on Lewis Street, to manufacture electrical goods, fuses, etc.

The Brazil Motors Co., Brazil, Ind., is contemplating the establishment of a plant in Ontario. Welland, Port Colborne and Bridgeburg are under consideration.

The Delong Hook & Eye Co. will establish a Canadian branch plant in Woodstock, Ont., where property has been secured.

Moore, Cameron & Hill, Ltd., Montreal, have been incorporated with a capital stock of $100,000 by Arnold Wainwright, Aubrey H. Elder, Felix W. Hackett and others to manufacture railroad, marine, foundry, mining and contractors' supplies, etc.

The Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $5,000,000 by Edward H. Ambrose, Henry A. Burbidge, John R. Marshall and others to manufacture automobile tires, etc. It recently completed arrangements for the erection of a plant in Hamilton, on which construction will be started at an early date.

The Hills-Jansen Co., Ltd., Walkerville, Ont., has been incorporated with a capital stock of $40,000 by Clarence A. Hills, William B. Jansen, Stanley W. Jansen and others to manufacture automobile accessories, parts, etc.

The Canadian Consolidated Rubber Co., 1 Front Street East Toronto, is preparing plans for the erection of an additio nat Port Dalhousie, Ont., to cost $35,000. Manager, L. Leippert, Port Dalhousie.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	3.37c. to 4.00c.
Swedish bars, base price	20.00c.
Soft Steel:	
¾ to 1⅞ in., round and square	3.52c. to 3.62c.
1 to 6 in. x ⅜ to 1 in	3.52c. to 3.62c.
1 to 6 in. x ¼ to 5/16	3.62c. to 3.72c.
Rods—⅝ and 11/16	3.42c. to 3.67c.
Bands—1½ to 6 x 3/16 to No. 8	4.22c. to 4.32c.
Shapes:	
Beams and channels—3 to 15 in.	3.47c.
Angles:	
3 in. x ¼ in. and larger	
3 in. x 3/16 in. and ⅛ in	3.72c. to 3.97c.
1½ to 2½ in. x ⅛ in	3.52c. to 3.77c.
1½ to 2¾ in. x 3/16 in. and thicker	3.47c. to 3.72c.
1 to 1¼ in. x 3/16 in	3.52c. to 3.77c.
1 to 1¼ in. x ⅛ in	3.57c. to 3.82c.
⅞ x ⅞ x ⅛ in	3.62c. to 3.87c.
¾ x ⅛ in	3.67c. to 3.92c.
⅝ x ⅛ in	4.07c. to 4.72c.
½ x 3/32 in	5.17c. to 5.42c.
Tees:	
1 x ⅛ in	3.87c. to 4.12c.
1¼ in. x 1¼ x 3/16 in	3.77c. to 4.02c.
1½ to 2½ x ¼ in	3.57c. to 3.82c.
1½ to 2½ x 3/16 in	3.57c. to 3.82c.
3 in. and larger	3.52c

Merchant Steel

	Per lb.
Tire, 1½ x ½in. and larger	3.37c. to 3.62c.
Toe calk, ½ x ⅜ in. and larger	4.25c.
Open-hearth spring steel	6.00c.
Standard cast steel, base price	14.00c.
Extra cast steel	18.00 to 20.00c.
Special cast steel	23.00 to 25.00c.

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c.

Sheets

Blue Annealed

	Per lb.
No. 10	4.82c. to 5.80c.
No. 12	4.87c. to 5.85c.
No. 14	4.92c. to 5.90c.
No. 16	5.02c. to 6.00c.

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	6.05c. to 6.80c.	——
Nos. 22 and 24	6.10c. to 6.85c.	7.30c.
No. 26	6.15c. to 6.90c.	7.35c.
No. 28	6.25c. to 7.00c.	7.50c.
No. 30	6.45c. to 7.20c.	——

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per lb.
No. 14	6.60c. to 8.10c.
No. 16	6.75c. to 8.25c.
Nos. 18 and 20	6.90c. to 8.40c.
Nos. 22 and 24	7.05c. to 8.55c.
No. 26	7.20c. to 8.70c.
No. 27	7.35c. to 8.85c.
No. 28	7.50c. to 9.00c.
No. 30	8.00c. to 9.50c.

No. 28, 36 in. wide, 20c. higher.

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

Steel Wire

Base Price* on No. 9 Gage and Coarser	Per lb.
Bright basic	5.50c.
Annealed soft	5.50c.
Galvanized annealed	6.00c.
Coppered basic	6.00c.
Tinned soft Bessemer	7.50c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

Base Price	
High Brass Sheet	31c.
High Brass Wire	31c.
Brass Rod	30c.
Brass Tube	43½c.

Copper Sheets

Sheet copper, hot rolled, 16 oz., 32c. per lb. base.

Cold rolled, 14 oz. and heavier, 1½c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb....	$9.30	$9.05
		90 lb....	9.40	9.15
		100 lb....	9.50	9.25
IC...$15.00	$13.00	IC...	10.00	9.75
IX... 17.25	15.00	IX...	11.25	11.00
IXX... 19.00	16.75	IXX...	12.25	12.00
IXXX... 20.75	18.50	IXXX...	13.25	13.00
IXXXX... 22.25	20.25	IXXXX...	14.25	14.00

Terne Plates

8-lb. Coating 14x20

100 lb.	$9.35
IC	9.50
IX	10.50
Fire door stock	12.75

Tin

Straits pig	55½c. to 56½c.
Bar	62c. to 65c.
American pig, 99 per cent	56c. to 58c.

Copper

Lake Ingot	20 c. to 21 c.
Electrolytic	19½c. to 20 c.
Casting	19 c. to 19½c.

Spelter and Sheet Zinc

Western spelter	9c. to 9¼c.
Sheet zinc, No. 9 base, casks	12½c.; open 13c.

Lead and Solder*

American pig lead	7½c. to 7¾c
Bar lead	7¾c. to 8c.
Solder ½ and ½ guaranteed	37c.
No. 1 solder	33c.
Refined solder	28c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c.
Commercial grade, per lb.	50c.

Antimony

Asiatic	10c. to 10½c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.....33c. to 35c.

Old Metals

The market is stronger. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible	16.00
Copper, heavy and wire	15.00
Copper, light and bottoms	13.00
Brass, heavy	10.00
Brass, light	7.00
Heavy machine composition	15.00
No. 1 yellow rod brass turnings	9.00
No. 1 red brass or composition turnings	12.00
Lead, heavy	5.75
Lead, tea	4.00
Zinc	5.00